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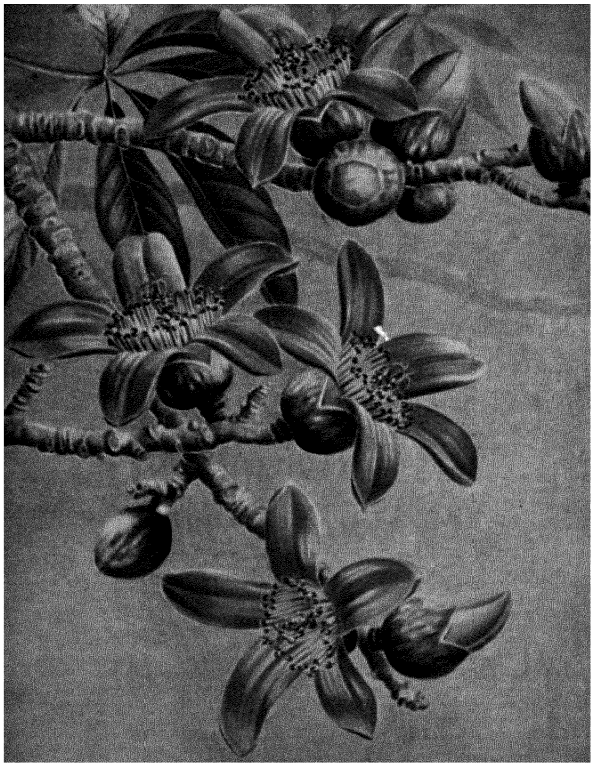
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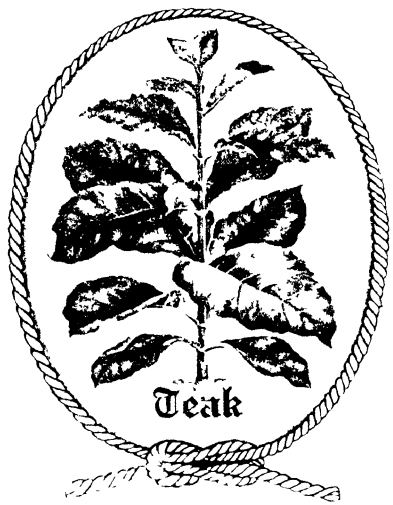
ONE HUNDRED YEARS OF INDIAN FORESTRY

VOLUME ONE: SOUVENIR



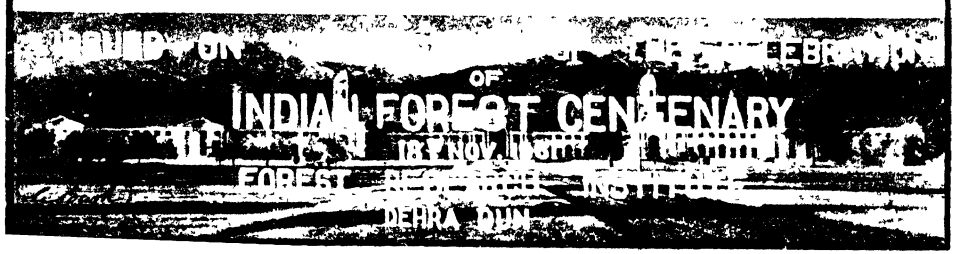
100 YEARS
OF
INDIAN FORESTRY

1861



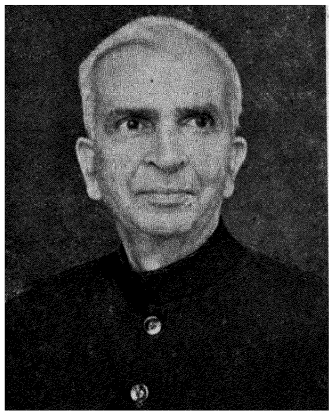
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FOREWORD

The basic problem of Forestry is one of Policy Often there is considerable delay in the general recognition of the need, in a country, for maintaining large areas under forests in order to provide raw materials for manifold uses, to prevent deterioration and wasting away of soils, to temper the climate and to regulate stream-flow The clear enunciation of principles and the declaration of objectives is the next big step The last and most difficult part of the task is the implementation of the policies which impose local checks in the larger interests of the nation.

It would not be wrong to say that, in a way, even in ancient times there had been a dim conception of the important role of forests in a nation's economy We have references in the Ramayana to the occurrence of severe droughts, and to the worship of the forest-born Sringa, the bringer of rains Kautilya's political writings of the 4th century B C refer to certain arrangements for the protection of woodlands, for the appointment of officers for supervision of forest operations, and the collection of revenue from produce removed from the forests In the same century we find Plato drawing attention to the damage caused to Grecian orchards through soil erosion consequent on deforestation of hill slopes But such ideas did not appear to have gained wide currency, and the relationship between forests, floods, landslides, droughts, soil losses, lowering of water tables, etc , remained un-understood for many subsequent centuries Large blocks of forests survived only in extremely inaccessible regions, or where kings and nobles maintained them as hunting reserves

Earlier in human history entire civilizations in Central and South America, in Africa and the Middle East were destroyed by the adverse conditions brought about by the rapacious use of natural resources Large sections of Asia still suffer from the effects of continued misuse of woodlands through shifting cultivation, overgrazing by cattle, burning, and unregulated removal of forest material

It is only during the last few centuries that there has been a realisation of the great importance of forests as a valuable and perpetually renewable natural resource, under good use The forest policies of the progressive countries of Europe took concrete shape mostly

in the 18th and 19th centuries The British of the period were unacquainted with the principles of forestry science The economy of their poorly wooded country had a strongly industrial bias, and there were, in any case, large sylvan resources, within their far-flung empire, including the forests of India which were then regarded as inexhaustible It was therefore that the settled conditions which followed the British occupation of India witnessed no check, but rather an increased tempo of the destruction of the great timber forests of the country for the expansion of agriculture, setting up of new villages and towns, running of arterial roads construction of railway lines, and for the obtaining of large quantities of timber for the Navy and other Defence requirements

Some idea of the need for controlling the pace of destruction of forests in India and of setting apart some timbered regions for careful management to meet the growing demands for timber and fuel began to take shape in the 1840s Some attempts at systematic forest operations were made in Madras and Bombay Presidencies, in the Punjab and what was then known as Upper India, between 1840 and 1860 It was during this time, too that Conolly, the farsighted Collector of Malabar, assisted by the devoted Chathu Menon (two names to conjure with in Indian forestry) started the Nilambur teak plantations which are now world-famous But it was not till early in the seventh decade of the 19th century that the urgency of forest conservation was keenly felt It was a sad commentary on the lack of appreciation of the timber position of the country at the time that it was recorded even in 1860 "It is still necessary to import railway sleepers from Norway because the available supply of suitable timber from indigenous sources is too costly and too small"

From then onwards however definite steps were taken for the methodical inspection and conservation of large forests, Brandis a noted German Forest Officer was invited from Burma to help in drawing up plans for the conservation and proper management of the vast and unexplored forests of Assam and Bengal From 1861 too, forest conservation took a practical shape in the "great mass of forest-covered hills occupying Central India" till then unknown to British officials as also to the local population of the surrounding plains This great work began under the wise direction of Richard Temple, the first Chief Commissioner of the newly created Central Provinces and G F Pearson, the first Conservator for the region

Since then we have had a century of steady extension of scientific forestry throughout India The first three decades were mainly spent in demarcation of boundaries and the constitution of Reserved and Protected forests often in the teeth of considerable opposition The next three decades witnessed experimentation on a large scale with systems of management applicable to various types of forests, planting techniques of numerous species of trees, and the utilisation of timbers and other multifarious raw materials of the forests The two World Wars and the interregnum between them served to emphasize the great dependence of the country on its timber resources during periods of war as well as of peace Since the 1930s there has been much world-wide awakening to the great role of forests as protective agents mainly as a result of experiences in the U S A Where determined efforts have since been made to reclothe deforested lands, rehabilitate sparsely-covered watersheds and control floods and soil erosion

Recent years of Independence have witnessed a greatly increased tempo of forest activities and a big development of forest-based industries in our country With rising standards of living increase in population, and brisk industrialisation we find that our once "inexhaustible" forests are no longer adequate to meet even our current demands, their output is certainly far short of projected requirements We are also keenly conscious of the rapid diminution in the numbers and variety of our wild animals and birds as a result of greatly increased human interference.

In 1952 a clear-cut National Forest Policy was first enunciated, drawing the attention of the people to the need for maintaining the existing forests in a productive stage, reclothing barren lands and hill slopes, and increasing the forest area of the country to a third of the land surface so as to serve effectively the two-fold roles of protection and production On the other hand, special competition by the more spectacular development plans, such as river valley projects, mining, power installations, new industrial units, the grow-more-food campaign the rehabilitation of refugees, and the care for tribal population have been taking a heavier and more rapid toll of forest land than ever before We thus come back to the crux of the matter, namely, the implementation of a sound policy as the basic problem of forestry All other forestry development can be built only on that firm foundation

Set down in the pages that follow are the efforts of the great pioneers at the introduction of scientific forestry into this country, and the various processes by which the magnificent edifice of forestry in all its aspects -consolidation, protection, establishment of communications, exploitation, regeneration, utilisation research education and training has been built up during the last one hundred years Also has been noted the great contribution of Indian forests to the national economy, inclusive of aspects whose value in terms of money is not ordinarily estimated or taken into consideration It is hoped that this publication will help the people of our country to realise how immensely important are forests to the well-being of a nation-promoting industry, providing billions of gallons of regulated water, sustaining agriculture, sheltering wild life of great variety and charm, healing the tired bodies and spirits of men women and children, and providing recreation and inspiration

How far our forests will continue to serve these purposes in the centuries to follow will depend on how effectively it will be possible to implement far-sighted policies

Meliora speramus

V S RAO
Inspector-General of Forests
Government of India

NEW DELHI,
July, 1961



But the glory of trees is more than their gifts,
'Tis a beautiful wonder of line that lifts,
From a wrinkled seed in an earthbound clod,
A column, an arch in the temple of God,
A pillar of power, a dome of delight,
A shrine of song, and a joy of sight;
Their roots are nurses of rivers in birth,
Their leaves are alive with the breath of the earth,
They shelter the dwellings of man, and they bend,
O'er his grave with the look of a loving friend"

—Henry Van Dyke

PREFACE



"An age builds up cities; an hour destroys them
In a moment the ashes are made, but a forest is
a long time growing"

—*Seneca,* from Latin

This Souvenir is a brief survey of the growth of Indian Forest Administration from a small beginning and gives a general picture of its outstanding achievements in various fields during the last 100 years

The period between 1856 and 1864 was one of intense activity in the organisation of Forest Department, and the year 1961 has therefore been selected as a representative year for celebrating the Centenary of Forest Administration

We owe a deep debt of gratitude to Sir Dietrich Brandis and other pioneers, who, by their foresight and initiative, laid the foundation for the sound management of the forests of India by enunciating the basic principles of forest conservancy

Forests are a natural asset of inestimable value to the people, inasmuch as they preserve the physical features, prevent floods, check the flow of sub soil water and thus help to maintain the productivity of cultivated land Forests also supply a variety of much needed forest products, such as timber, firewood, industrial raw materials for making paper and minor forest products like honey, wax, soap-nut, horns, medicinal plants, etc

Forests are the abode of wild life and add to the scenic beauty of the landscape The ameliorative role of well-managed forests is generally taken for granted The need for them is realised only when destruction of forests brings about distress due to shortage of essential forest products, by causing floods, and damage to agricultural lands which adversely affects the economy of the people It is to ward off such calamity that the forester, against heavy odds and adverse public opinion, advises Government to impose reasonable restrictions to counteract the instinctive urge of man to use forests for his immediate benefit, unmindful of the well-being of posterity He also endeavours to make the people forest-minded to enlist their willing cooperation for their protection As the prosperity of a country does not depend only on the present generation but on the well-being of successive generations, he advises Government to lay down a far-sighted forest policy and to implement it, so that the forests may be kept perpetually productive and useful.

But even so, inroads on forests have continued Forests have been depleted by haphazard cuttings, overgrazing and incendiary fires by the short-sighted peasantry and of late by wholesale excisions of large areas for submersion under river valley projects for extending cultivation While certain forests which have been scientifically conserved have definitely improved, by and large, our forests do not yield even a tenth of the increment they can give on a sustained basis Indeed, large areas have got so depleted that their rehabilitation may prove to be economically infeasible

It is but meet therefore that on an occasion like this, when our Forest Administration is one hundred years old, we take a bird's eye-view of the picture and see its lights and shades and then suggest how it could be retouched and made more attractive We have many achievements to our credit such as laying down a sound forest policy preparation of management plans on scientific lines and creation of plantations of valuable species like teak, *Eucalyptus* and other industrial woods We have also done creditable research on the regeneration and utilization of forests and established many forest industries, notably manufacture of paper and plywood production of lac, turpentine etc But we cannot rest on our laurels, turning the blind eye to our shortcomings and failures We have allowed the accessible forests to be destroyed, yielding to popular clamour, and given little attention to minimising waste, particularly of fuelwood, the consumption of which could be reduced by using improved hearths, much of it could also be diverted for use as timber, after preservative treatment if necessary The depletion of forests is hampering our progress We are particularly short of cellulosic raw material for making enough newsprint and paper, which is so necessary for increasing literacy and which we cannot afford to import

At this juncture, when the country is passing through a phase of rapid industrialization, a number of forest-based industries are being set up Even the existing factories are finding it difficult to get raw materials on a sustained basis It is equally necessary to rehabilitate the depleted forests, particularly the panchayat forests Augmenting our resources by re-afforestation of depleted forests, particularly denuded village forests, and creation of large-scale plantations of fast-growing species is clearly the way out In this connection plant introduction research has assumed great importance

The Forest Department as the custodian of a very valuable and easily vulnerable asset has a heavy responsibility to fulfil In a long term venture like forestry, the ill effects of unskilful management often do not become apparent for a considerable length of time, and may in the long run, prove highly detrimental to the interests of the people as a whole Many an excellent forest estate has been ruined through inefficient management This eventuality must, therefore, be carefully guarded against India is fortunate in having had a number of foresters of a very high calibre and sense of duty who through their unremitting efforts and foresight succeeded in laying the foundation of sound forest management well and truly A stable superstructure has now to be built If this is assured by carefully selecting the personnel and giving it the requisite facilities, it may with confidence be predicted that in her forests India has an asset of immense potential value which holds out a bright promise for the future

वन श्री त्राण, विश्व कल्याण!

K P SAGREIYA
President
Forest Research Institute and Colleges

DEHRA DUN:
July, 1961



ACKNOWLEDGMENTS

We are grateful to the distinguished persons and retired foresters in India and abroad who have kindly sent inspiring messages and contributions which will serve as a source of encouragement for generations of Indian foresters to come

Our thanks are due to the Heads of Forest Departments of the States in the country and their officers for providing the basic material for this compilation

Our thanks are particularly due to the following for contributing the various chapters —

Shri C R Ranganathan
Shri V S Rao
Shri C A R Bhadran
Shri T N Srivastava
Shri P Venkataramany

The task of compiling this Souvenir devolved on the staff of the Forest Research Institute and, particularly, on the Officer-in-Charge of the Editorial Board, who has served as the Secretary of the Centenary Publications Committee and has taken great pains to prepare the manuscript for the press

V S RAO
K P SAGREIYA
C A R BHADRAN
P VENKATARAMANY
Editorial Committee for
Forest Centenary Publications

NEW DELHI;
11th August 1961

"I think that I shall never see
A poem lovely as a tree
A tree whose hungry mouth is prest
Against the earth's sweet, flowing
A tree that looks at God all day
And lifts her leafy arms to pray,
A tree that may in summer wear
A nest of robins in her hair,
Upon whose bosom snow has lain,
Who intimately lives with rain
Poems are made by fools like me,
But only God can make a tree"

—Joyce Kilmer –'Trees'

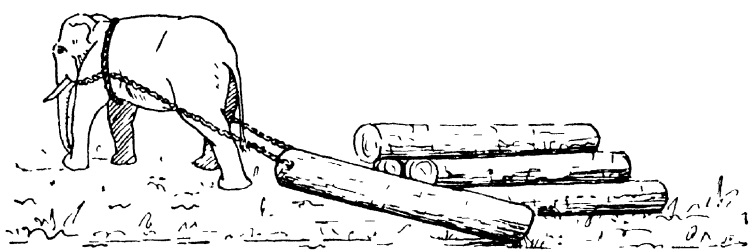


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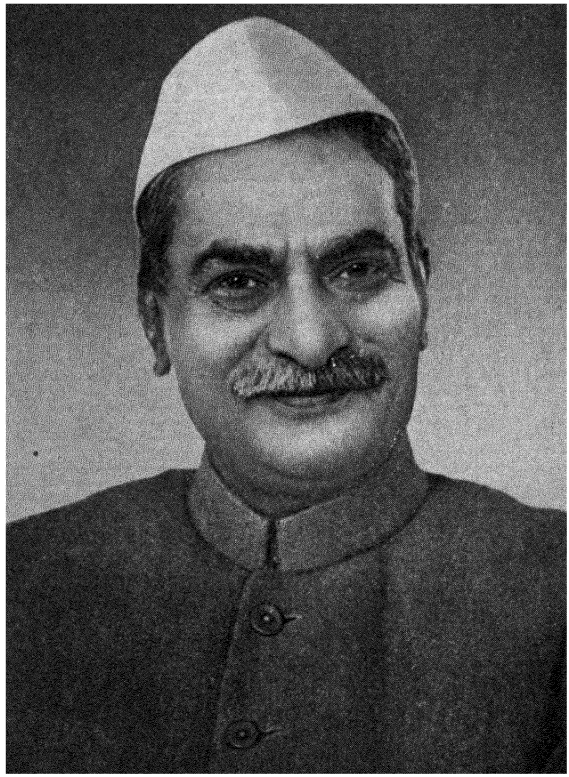
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What do we plant when we plant the tree?
We plant the ship that will cross the sea,
We plant the mast to carry the sails
We plant the planks to withstand the gales
The keel and keelson, and keam and knee
We plant the ship when we plant the tree

—**Henry Abbey**


MESSAGES



RASHTRAPATI BHAVAN,
NEW DELHI

February 3, 1961
Magh 14, 1882(Saka).

It was a happy idea to have brought out a publication on Indian Forestry at the time of the Centenary of Forest Departments in India. The decision to compile descriptive and informative details about our forest wealth in popular language has to be particularly welcomed. I wonder sometimes if there is any other natural source which gives us so much and of which we know so little as the forests. There is, therefore, a good case for producing readable literature to enlighten the common people about India's forest wealth. The proposed reference book on Indian Forestry, which is going to be the second volume of this series, and the present volume should go a long way in dispelling people's ignorance of their benefactor, the forests.

Rajendra Prasad





VICE PRESIDENT
INDIA
NEW DELHI

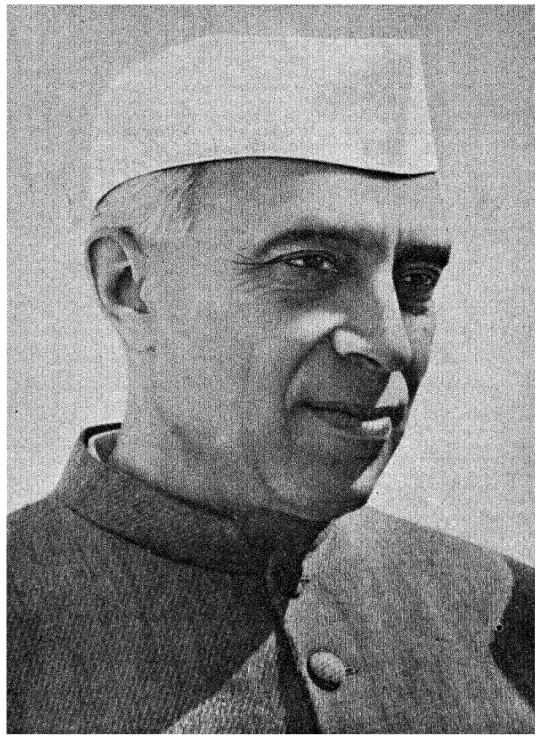
September 23, 1960.

I am glad to know that you are bringing out a publication on Indian Forestry at the time of the Centenary of Forest Departments in India in 1961.

I cannot say that we have been preserving our forests with great care. Forest wealth is of use to us in many different ways and it is essential that we should increase that wealth and not cut down trees recklessly. Many people have to be educated with regard to the proper treatment of forests.

With best wishes,

(S. Radhakrishnan)



PRIME MINISTER'S HOUSE
NEW DELHI

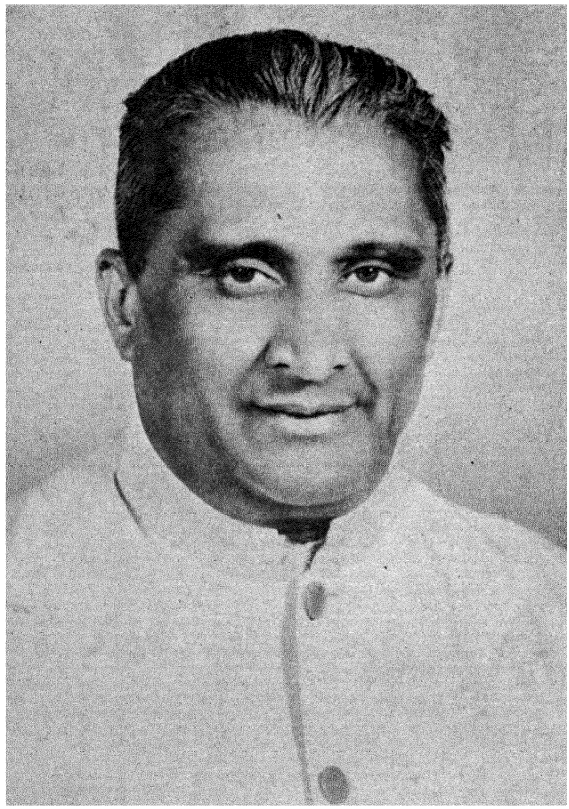
MESSAGE

The Centenary of the Forest Departments in India is an event which deserves celebration. Even though these Departments have existed for a hundred years, forestry has perhaps not had as much attention paid to it as is its due. In the economy of Nature, forests are of the utmost importance. But with the spread of industrial civilization and the rapid growth of populations, unhappily forests tend to disappear. We are apt to forget that in so far as this happens, we are upsetting that economy of Nature and doing injury to man. I am pained when I see a noble tree, which has taken long to grow and spread out in all its majesty, cut down by careless hands. There should be a strong feeling among our people to prevent this vandalism. If such cutting down becomes unavoidable, we should develop a convention that it should be replaced immediately by planting two trees.

I hope that the vital importance of forests will be fully realised.

Jawaharlal Nehru

New Delhi,
April 19, 1960.



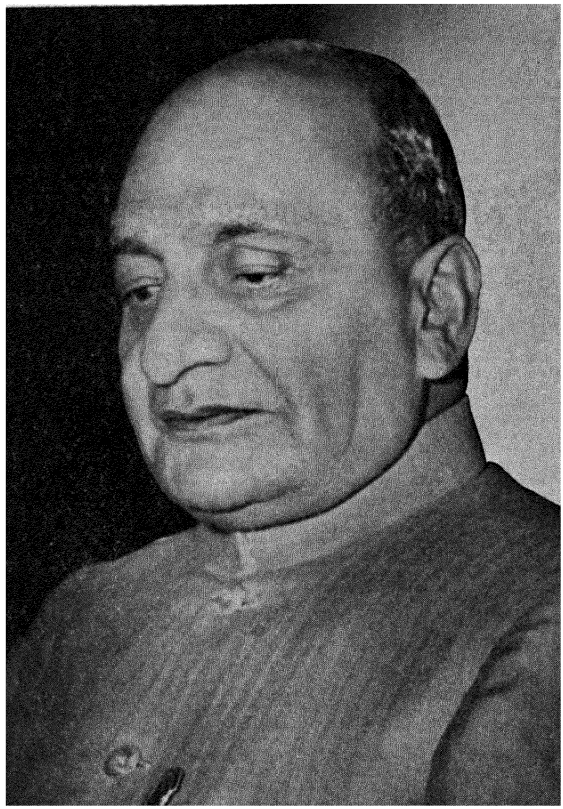
MESSAGE FROM SHRI S. K. PATIL, MINISTER FOR FOOD AND AGRICULTURE, GOVERNMENT OF INDIA, DATED 9TH AUGUST, 1961

I am very happy to know that the Centenary of the initiation of Scientific Forestry in India is being celebrated this year

Forests, as natural resources, yield a variety of products which are essential for our basic needs They provide stability and fertility to our soils, stop erosion, prevent floods and make available perennial and abundant supplies of pure water which are so necessary for the development of our agricultural economy

In the struggle for existence or in competition with nature, we are apt to follow the path of least resistance and lay our hands on these rich resources without any forethought of their replacement and expansion for future requirements The history of the denudation of our forest resources is replete with instances of cruel exploitation of this valuable national wealth with the result that today we have barely 23 per cent of our total land area under forest cover Planned exploitation of our forest resources based on the principle of preservation and replacement is therefore a matter of vital necessity Our national forest policy has rightly stressed the need for ensuring that a minimum of one-third of our land area is maintained under forests

It is the responsibility of our Forest Departments to jealously guard this national asset with care and prudence so that its resources are steadily enriched and made available for our national development in a never-ending stream We should therefore regard this Centenary celebration as a pledge of our devotion to the cause of scientific and planned development of our valuable forest wealth.



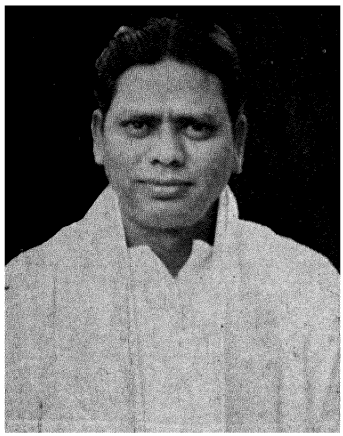
MESSAGE FROM DR. P. S. DESHMUKH, MINISTER FOR AGRICULTURE, GOVERNMENT OF INDIA, DATED 3RD AUGUST, 1961

There have been many departments of Government working in various countries ever since man took to living in well-organised communities looking after communications, town planning, industry, minerals, agriculture, irrigation, defence, etc But a governmental organisation devoted to the proper management of forests is of comparatively recent origin in any country This is so because, in spite of the large contributions which forests always made to the economy of a country, they were for long considered to be of little consequence In any case, forests were seen to exist for centuries and people remained under the impression that they were inexhaustible and required no regular management

In many parts of the world, forests would still have continued to survive though slowly diminishing in extent The industrial revolution, however, transformed the tempo of living, made possible the establishment of extensive and permanent communications, aided quick transport, opened up hitherto inaccessible hilly terrain and jungle fastnesses, and provided easy ways of over-powering wild animals They also fought the maladies arising from marshy lands and other hazards of living in forests This very revolution also brought about a radical change in the habits and living conditions of men on a very large scale Many new articles of human comfort and enjoyment came to be manufactured with machines from wood, minerals and agricultural products which were till then unknown in such varieties and fashions With much smaller populations and vast jungles the world was slow to realise the importance of forests as a great and perpetually renewable natural resource that can provide not only timber and firewood for uses of immemorial custom but also for many new purposes such as for making paper, rayon, plywood, chipboards and compressed, laminated and treated timbers of great strength and durability Apart from this the world has also learnt how important woodlands are for prevention of floods, saving the soil, tempering the climate and safeguarding water supplies Gradually too has it recognised the folly of waging a war of extermination on the wild life of the forests instead of managing it in such a manner as to ensure the continued survival of the manifold beautiful and interesting wealth of wild animals and birds

It is, therefore, a matter for much gratification that the Forest Centenary is being celebrated in India during 1961 An impressive volume of work has been done by forest officers in the matter of demarcation, reservation, establishment of communications, study of the needs of various species of trees, raising large plantations of valuable timbers, conducting research into the uses of woods and numerous other products of the forests, supplying large quantities of raw material for the use of industries, and round and fashioned timber for various puublic bodies and organizations of the State and Central Governments During the nine years of my office as Union Minister for Agriculture, I have been anxiously following the fortunes of the forests I congratulate the forest officers of the country for the impressive work they have done and I trust that the country can look forward to a second century of good record greatly surpassing that of the first.

MESSAGE FROM SHRI D. SANJIVAYYA, CHIEF MINISTER, ANDHRA PRADESH, HYDERABAD, DATED 28TH APRIL, 1961



The importance of preservation, regeneration and extension of forests to ensure proper economic development by providing necessary raw material for industrial progress and creating optimum seasonal conditions for good agricultural production in the country cannot be over-emphasised and the part the Forest Administration has to play in achieving the above objectives has to be constantly borne in mind

I am glad to learn that you are bringing out a Souvenir on the occasion of Centenary of Forest Administration in India and wish all those engaged in the important nation building activity, unqualified success

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MESSAGE FROM SHRI HARESHWAR DAS, MINISTER FOR FORESTS, ASSAM, DATED JULY 1961

I have great pleasure in sending my cordial greetings to all those who are serving the country in the sphere of forestry, on the occasion of the celebration of the Centenary of the Forest Departments in India

From very small beginnings a century ago, as a result of the diligent and intelligent efforts of a band of workers comprised of technically qualified personnel and those who have not been so equipped but yet concerned with the formulation of forestry policy and administration, a valuable asset in the form of well-conserved and managed forests has been built up in our country, of which we can be justly proud and which has evoked the admiration of foresters all over the world

It is but proper that during this celebration we remember those foresters who have passed away, who during their life time had been associated with the building of this magnificent edifice

In the beginning of the life of the Departments, the main work was constitution of areas to be permanently dedicated to Forestry and exploitation of excess growing-stock in such areas The work then developed to a stage when the maintenance of the sustained output of the different articles of forest produce, which the country's overwhelmingly rural population needed for the daily avocations, was their main duty As a broad national policy, till the attainment of independence by the country, forestry was considered the hand-maid of agriculture Her function was considered primarily to assist agriculture by preserving soil and moisture and by tree-growth, and provision of materials for rural housing, rural implements, firewood, grazing, etc, i e, services associated with a rural economy The contribution that Forestry made to maintenance and extension of railway and river transport and the development of industries was not then high-lighted

It was principally after attainment of Independence that the significant role that scientifically managed forests have to play in the development of industries and in the sphere of maintenance and expansion of transport and in the defence of the country was realised and enunciated in the statement of national forest policy The

role of scientific forestry in the sphere of providing sustained employment in the forests themselves and in forest industries is only now being increasingly appreciated

However, owing to the increasing pressure on land for agricultural use, the need of maintaining adequate areas dedicated for scientific forestry is tending to be overlooked, a danger which all of us associated with forestry have to guard against and combat by adequately publicising the essential rôle that Forestry has to play in every civilised society It is in the fitness of things, therefore, from this point of view also, that this celebration of ours should take place

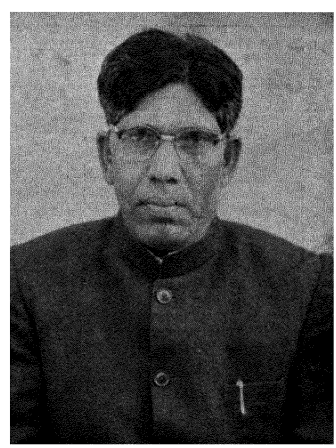
Forestry in my State of Assam, like her sister States has followed the general pattern of development in India, with this significant difference that a great deal of her forest resources have, till recently, remained inadequately exploited and utilised, because of her geographical position *vis-a-vis* the densely populated and already more industrialised areas of our country However with the increasing shortages of forest produce both for ordinary and industrial uses in these densely populated areas, larger and larger demands are being placed on the forest resources of my State and more and more industries are being establish ed or proposed to be established, utilising fores produce as raw materials With a well-establishe tea industry in the State, the tea-chest plywoo industry in Assam has become strong under th fostering care of the State Government In respec of other forest industries also, Assam looks for ward with confidence to play, in the near futur an increasingly important role, particularly in th paper and rayon manufacturing fields, thu contributing to the general economic progress c the country

The luxuriance of the vegetation in th forests of my State and the variety of species tha they contain are well known and their more eff cient utilisation is only awaiting the develop ment of power and transport, the investment c capital and the conduct of research in a Regiona Research Station

From this north-east corner of India, wit its forests having a rich and varied fauna an flora I once again send you my cordial greeting on this important occasion and wish continue success to all foresters in their endeavour to con tribute more and more to the progress of th country

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MESSAGE FROM SHRI BHOLA PASWAN SHASTRI, MINISTER OF FORESTS, WELFARE AND EXCISE, GOVERNMENT OF BIHAR, RANCHI. DATED 25TH JUNE, 1960



I am glad that the hundredth year of Forest Administration in India is being celebrated under the auspices of the Government of India The vital role of forests in the life of the people and in the development of a nation has been universally acknowledged In our country, however, people in general still feel that forests are the gift of God, which will take care of themselves It is of utmost importance that this incorrect appreciation about the forests is removed from the mind of the people I feel this Centenary Celebration of Forest Administration in India will help in making our people more forest-conscious

Bihar is the home of minerals and of big industries This State is often called the "Ruhr" of India The forests here have not only to cater to the needs of the vast agricultural population but have also to meet the ever-increasing demand of the developing industries With this impact of heavy demand the necessity of administering the forests in a scientific manner is doubly important, to ensure the maximum production per acre on a sustained basis

The first attempt at forest conservation in Bihar dates back to 1870 when the first block of forests in the District of Palamau was reserved The process of reservation of commercially valuable blocks of Government-owned forests continued until about 1918 This, however, took care of only 2,000 sq miles of forests out of a total of about 15,000 sq miles All attempts at legislation for the control and management of private forests failed until in 1946, the Bihar Private Forest Act was passed During this long period, which saw the two world wars, about one-third of the private forests had to make way for other land uses Under the Bihar Private Forest Act, Government took over control and management of all the private forests in the State, the ownership however rested with landlords Later in 1950 the Land Reforms Act was enacted and the ownership of the forests also vested in Government. Nearly 13,000 sq miles of States' land area is now under scientific forestry management

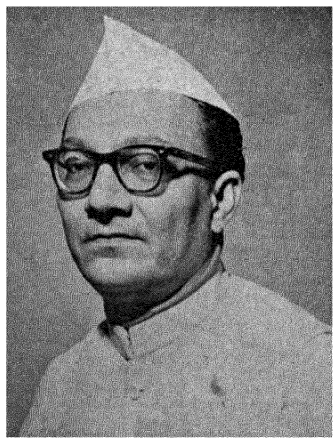
Most of these private forests are burdened with rights and are not necessarily a commercially profitable proposition—a consideration which guided the reservation of forests in the early days It is now well recognised that all forests, big or small, influence directly or indirectly the social and economic life of the community, the welfare of which is now the primary concern of the State

Forest Administration in the past has generally functioned more or less in isolation—away from the people This was understandable in the days when the few sq miles of right-free reserved forests, tugged away in the interior, had to be managed In the changed situation of the present day, however, forest departments have to manage the right-burdened forests with the good-will of the people inhabiting the forests The people's point of view has, therefore, to be understood by forest officers and orthodox forestry dove-tailed with the people's needs, consistent with the paramount objective of forest conservation The concept of forest administration in the country has, therefore, to be re-oriented

I join all others in expressing my gratitude to the past generation of foresters in the country on the pioneering work they have done in laying a sound foundation of scientific forestry in the country To the practising foresters of the present, I extend my hearty congratulations on their untiring devotion to the cause of forestry and on the manner in which they have shouldered their new responsibilities I am sure their love of the forest, the great cause of service to the people and the welfare of the posterity will continue to guide them in their future programme.

I wish the Centenary Celebrations all success

MESSAGE FROM SHRI HITENDRA DESAI, MINISTER FOR EDUCATION, AGRICULTURE AND LAW, SACHIVALAYA, GUJARAT AHMEDABAD, DATED 12TH APRIL, 1961



I am happy to learn that laudable attempt is made to publish a comprehensive book relating to various aspects of the practice of forestry and utilisation of forest products There appears to be no publication at present in this field which would present in a popular fashion such information The publication would almost synchronise with the commencement of the Third Five-Year Plan when vigorous attempts are being made to improve the existing forests as also to create forests wherever possible In this task of forestry development, the co-operation of the people is most essential This publication would bring the common man nearer to the development of the work of forest It will be better if copies of the publication are also printed in the regional languages so that common people can also understand about forests.

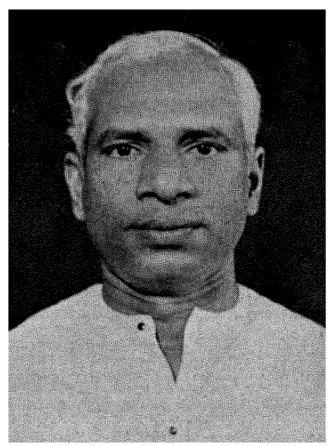
MESSAGE FROM SHRI G. N. WANI SOGAMI, MINISTER OF STATE FOR FORESTS, FISHERIES, JAMMU AND KASHMIR, DATED 28TH APRIL, 1960

With the attainment of Independence we, in India, have awakened not only to the problems of freedom but also to the natural wealth that is available to us for the purpose of our economic reconstruction Among the natural resources of our country, forests occupy a paramount place. On the basis of experience gained in our State where forests have been worked under scientific methods since a long time now, we come to the conclusion that systematic and efficient exploitation of forest resources on modern lines under scientific systems of management will go a long way to augment the industrial potential of India Side by side with the exploitation of forests, silviculture, regeneration-cum-afforestation and soil conservation have got to be given a place of priority Soil conservation particularly has assumed country-wide importance owing to natural calamities that have become a common feature now, due to unimaginative and ruthless action of man, necessitating protection of water regime in our part of the country.

I am glad that on the occasion of the Centenary of the Forest Department in India, the Central Board of Forestry is bringing out an Indian Forestry Book to make available comprehensive and up-to-date information regarding forestry I am sure this book will be a compendium of relevant data of the forests in India

I wish the Board all success in this venture.

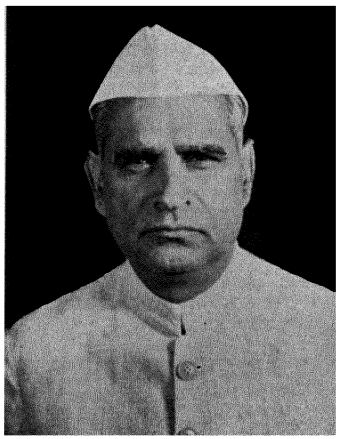
MESSAGE FROM SHRI E. P. POULOSE, MINISTER FOR FOOD AND AGRICULTURE, KERALA STATE, TRIVANDRUM, DATED 21ST APRIL, 1960



I am happy to learn that the Central Board of Forestry is publishing a book on Indian Forestry The need for authentic and accurate information regarding forests in India, which abound in natural resources, had been long-felt, more so in this age of planting I am confident that the book will be a valuable asset to the Forest Department and a befitting commemoration of its Centenary

I wish the venture success

MESSAGE FROM SHRI SHAMBHUNATH SHUKLA, MINISTER FOR FORESTS, MADHYA PRADESH, BHOPAL, DATED 22ND JUNE, 1960



India celebrates the Centenary of the Forest Department started in the year 1860 At this juncture one might peep into the past to see that role the forests have played in the life of the people since the first embers of civilisation were lit several centuries ago in this ancient land of ours

When the Aryans came to India, there is evidence to show that a Dravidian civilisation of a high order flourished in the country, which apparently lived in consonance with the thick forests that abounded The Aryans were primarily a pastoral people To provide shelter for themselves and to the animals they had domesticated, they cleared the forests wherever they went But even so, being worshippers of Nature, they preferred for their abode and even for their educational centres, sylvan surroundings and inspiring landscape It is here that the *Vedas* and the *Upanishads* were composed, which sing the glory of the Creator and lay down precepts of conduct for Man to live righteously Forests were still plentiful.

When the first great epic 'Ramayana' was written there were dense forests in Chitrakut, Dandakaranya and Panchvati which abounded in wild life At the time when the 'Mahabharat' was written onslaughts were being made on the forests and we read of the burning of 'Khandava Vana'

To prevent further destruction of forests which was adversely affecting the life of the people, cutting of trees was declared a sin, and the planting of trees an act of piety, in the 'Puranas' Several useful species of trees were thus saved from being destroyed such as banyan, *tulsi*, neem, bel, etc, but even so, some have disappeared from our forests, for instance, *ashoka* and *kadamba* By the time of Ashoka, accessible forests had been heavily felled and their absence was beginning to be felt Therefore, this far-sighted monarch ordered that useful trees be planted along the roads and in camping places. We read in his inscriptions that he even encouraged the cultivation of medicinal plants In Kautilya's time, protection of forests, planting of new species and the preservation of Wild Life were considered very important works and a special officer was appointed for the purpose

Coming nearer home Sher Shah Suri planted avenues along with high-way from Patna to Delhi The Gonds and Marathas also planted mangoes and other useful trees on open spaces

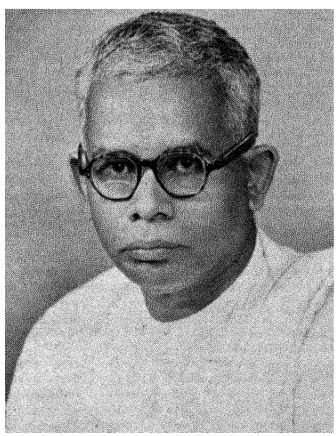
During the period of anarchy, following the decline of the Moghul Empire, forests were being destroyed indiscriminately It was primarily to put a stop to such wanton destruction and thus save the forest wealth of India, that the Government of India created a Forest Department in the 'sixties' of last century The main work it did in the beginning was to delimit all valuable forests, and later, after passing the Indian Forest Act, declaring them as reserved forests, under which all adverse rights were extinguished so that the department was free to develop them to realise the particular object of management A typical example of this is the Boori Forest of Madhya Pradesh, which was the first forest in India to be fire-protected from 1874 It has been successfully protected ever since Today in the mature stands of this forest the growing stock per acre is worth over a lakh of rupees, which incidentally shows the potentialities of these forests under scientific management, provided it is free from adverse rights This is a pointer to intensive development of the best areas as *commercial* forests Forests also mitigate floods, prevent soil erosion, regulate sub-soil water regime and thus maintain the productivity of lands For this purpose hilly regions and banks of streams should be maintained as *protection* forests In a predominantly agricultural country where the cultivators depend on neighbouring

forests for their essential requirements of small timber and other forest products, it is very necessary to have forests dotted all over the intensively cultivated tracts to meet the bonafide demands amicably Hence the need for *Nistar* forests

Lastly, the small tree-clad places and open spaces in villages will be best utilised for the production of fuel, fodder, fencing material, etc., and to graze the agricultural stock as *Village forests*

In so far as Madhya Pradesh is concerned, its extensive forests are not yet fully developed and there is a continuous demand for disforestation for expanding cultivation The best arrangement would be to ensure balanced and rational distribution of land for agriculture and forestry and to convince the people that conservation of forests is absolutely essential in their own interests In fact, wanton destruction of forests is a crime against posterity and as trustees of the forests, it is the duty of the present generation to perpetuate them.

MESSAGE FROM SHRI M. BHAKTAVATSALAM, MINISTER FOR HOME AND FORESTS, MADRAS, DATED 18TH AUGUST, 1960



I consider it a rare privilege to associate myself with the Centenary of Forestry in India As the Minister-in-charge of the Forests of Madras State, I have had occasion to gain an insight into the vital role that forests play in the welfare of the people I have also, as a member of the Central Board of Forestry, had occasion to see forests and forestry in most other parts of the country

India includes a great variety of climates and as a result many types of forests the dense evergreen forests of Assam and the West Coast, the beautiful coniferous forests of the Western Himalayas, the valuable teak forests of the Western Ghats and Central India, the rich sal forests of the sub-montane Himalayas, and the humble yet useful scrub forests of the arid zone of the Deccan and Rajasthan Each type requires its own treatment based on prolonged studies and observations in order that it may serve us best And it is heartening to recollect that such attention has been given to a satisfactory extent to all these areas in these first hundred years

While for India as a whole, regular forest management is taken to have commenced with the appointment of the first Inspector-General of Forests with the Government of India, actually quite a few States had started organising their forests under technically qualified Conservators of Forests even earlier I may recall here that the Madras State completed the first hundred years of regular forestry in 1956 and formally observed the first Centenary in April 1958 What these celebrations high-lighted will, I am sure, be even more significantly brought to light in this all-India Centenary, viz, (a) that, in a long term venture like forestry, a hundred years can scarcely be more than the first landmark in our efforts towards establishing forests truly productive in perpetuity, (b) that the foundations of good forestry have been well and truly laid in our land, where forestry has so vital a part to play towards better agriculture and rural prosperity; (c) that our forestry is dynamic and capable of those adjustments and changes which are called for in a rapidly progressing economy, but within the four corners of sound forestry, viz, silviculture, management, protection and forest utilisation, (d) that there is vast scope for further development of the forests of the country inspite of regular management for many decades, and (e) that our technical forestry staff is well-organised, devoted to its special cause and poised for still greater effort

On the occasion of this first Centenary of Forestry in India, I send my greetings to all forest workers in the country and I do hope that through their continued efforts our forestry will progress from strength to strength.

MESSAGE FROM SHRI B. G. GHADE, MINISTER FOR RURAL DEVELOPMENT AND FORESTS, MAHARASHTRA, BOMBAY, DATED 19TH MAY, 1960



In an agricultural economy like ours, forests play a vital role The role of forests and trees is not confined only to the production of material for human use, their protective role is even greater, as they prevent floods, reduce the intensity of dust-storms, arrest the spread of deserts, attract rainfall and thus maintain the balance in nature which is vitally required for the prosperity of a country Agriculture and forestry are complementary to each other A balanced development of both is essential for the prosperity of agriculturists

Our country has suffered a great deal by irresponsible felling of trees and the denudation of forests with the result that the rainfall has been scanty and irregular and crops have suffered either due to scarcity of rain or due to excessive or untimely rains All this can be mitigated if forests are maintained and developed on scientific lines

I am glad to know that the Central Board of Forestry is bringing out an Indian Forestry Book containing comprehensive and up-to-date information regarding forestry, on the occasion of the Centenary of the Forest Department in India due to be celebrated in 1961 This will be a very useful addition to the literature on forests and forestry

I wish every success to this publication.

MESSAGE FROM SHRI K. F. PATIL, MINISTER FOR FORESTS AND TRANSPORT, MYSORE, BANGALORE, DATED 29TH APRIL, 1960

I am happy to note that the Forest Research Institute at the instance of Central Board of Forestry is bringing out a Souvenir (Indian Forestry Book) to commemorate the Centenary of the Forest Departments in India On this occasion it is worthwhile taking stock of the problems faced by the Departments and their achievements during the course of one century of their existence and also to address ourselves to the tasks facing us

Forests are the result of silent work of nature over ages As long as the wants of man were limited and the nature's bounty in forest resources was plentiful, it mattered not how the forests were treated But with the growing population all over the world and with the ever-increasing want, this happy situation could not continue for long With this realisation, the need for organised forestry for the purposes of conserving and development of forest resources was felt The achievements of the Forest Departments are many. Though much has been done, much more remains to be done This is an occasion to remember the lessons of history which have taught humanity that neglect to preserve this wealth may ultimately lead to disappearance of great civilisations as in Mesopotamia and other regions where forest preceded man and desert followed him

The National Forest Policy enunciated in 1952 has clearly indicated the obligations of this generation to posterity in that "though the needs of the local population must be met to a reasonable extent, national interests should not be sacrificed because they are not directly discernible, nor should the rights and interests of future generations be subordinated to the improvidence of the present generation" It is, therefore, worth remembering that under the popular clamour for increased land for cultivation, forests cannot be axed in view of the necessity for maintaining the minimum forest area laid down, more so because the country is facing acute shortage of timber and firewood In this context, it may be reiterated that the salvation of India lies in intensive

cultivation for growing more food for our ever-increasing population rather than in extensive cultivation at the sacrifice of forests

The Forest Department of Mysore has nearly doubled its afforestation programme in the course of the last three years and today we are afforesting an area of nearly 30,000 acres per year and it has set before it a target of afforesting 2,76,000 acres during the III Five-Year Plan in the fulfilment of which not only firewood species, but species of economic importance and the industrial woods would be planted In this manner, the challenge of the future will be met and I have no doubt that the sister departments in the other States will do like-wise

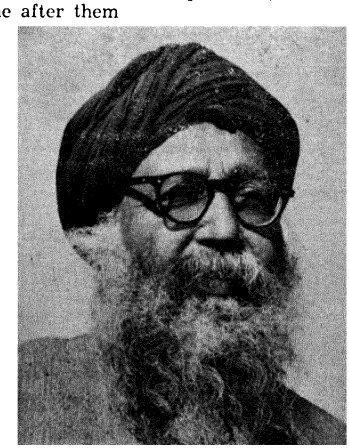
If humanity is to survive, it is essential that forests in certain decent percentage shall have to survive too Plant life, animal life and human life are directly and indirectly co-related to each other and inter-dependent on each other to such an extent that if plant life is eliminated from the earth, human life is also bound to collapse If this hard truth is not realised early and destruction of forest is allowed to go unchecked on the scale that is going on so long and if it is not reimbursed on a large scale, the present generation will have to be held liable for accusation of self-destruction

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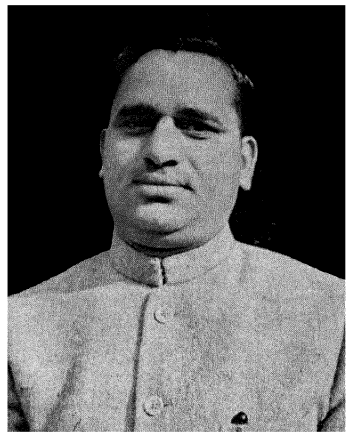
MESSAGE FRAM GIANI KARTAR SINGH, AGRICULTURE AND FOREST MINISTER, PUNJAB, CHANDIGARH, DATED 17TH JUNE, 1961

I am very glad the Centenary of the Forest Departments in India is being celebrated During these hundred years, we have come a long way from the primitive idea that forests are merely store-houses of wood, on which we could draw whenever the need arises, or that they are an insufferable nuisance, which must be removed to make way for cultivation and grazing We have come to realise the abundance of benefits which their presence bestows on the lands where they grow and on the human beings who live near them We are now becoming aware of the balance which should be maintained between their existence and the innumerable demands of various kinds made on them We have attained some success through the institution of Van Mahotsav festivals and Soil Conservation Centres in re-establishing among our people the respect in which the trees were held in the days of our ancestors This occasion provides us with the opportunity not only to look back how far we have progressed but to look forward to see how far we have still to go, and so not to rest on our ploughs but to be on our way more zealously until we attain perfect harmony between the benefactor and the beneficiary

We take this opportunity of paying homage to all those, no matter of what nationality, who devoted their lives as members of Forest Departments to nurse and guard zealously these forests, and who with their observations and research contributed to the knowledge so essential for the well-being of the forests as well as to attain full benefits from them without harming them We also pay tribute to those who are engaged in this gigantic work and in whose hands we have entrusted the task of welfare of these forests with the confidence and hope that with their hard, honest and intelligent work they will bring us nearer to the goal we have set for ourselves in our National Policy about forests May they be a source of inspiration, like those who have gone before them in this Department, for those who come after them

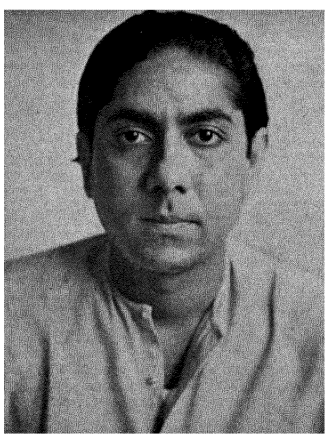


MESSAGE FROM SHRI SAMPAT RAM, MINISTER FOR FORESTS, RAJASTHAN, JAIPUR, DATED 19TH MAY, 1960



I am very glad to know that an Indian Forestry Book containing general description of the forests and the practice of forestry in India as also descriptive and up-to-date statistical data compiled by the Forest Research Institute, Dehra Dun, is being brought out in two volumes at the time of the Centenary of the Forest Departments in India The compilation of such an exhaustive work has been a long-left need This publication will, therefore, be a very useful reference book on Indian Forestry I congratulate the Central Board of Forestry for the commendable idea and for taking pains in implementing the same

MESSAGE FROM SHRI TARUN KANTI GHOSH, MINISTER-IN-CHARGE OF FORESTS, WEST BENGAL, CALCUTTA, DATED 7TH JUNE, 1961



The Centenary of Forest Administration in our country will be celebrated this year in a befitting manner. While it is true that a large area of forests had been preserved and managed scientifically in the past and that steps have been taken to increase the acreage of forests and to acquire privately owned forests for better management, I feel that we have still to go a long way before we can look back in retrospect with satisfaction and complacency

During the short period of my tenure as the Minister-in-charge of Forests, a feeling has grown in my mind that the people of our country are not yet fully conscious of the importance of preserving the forest wealth both for the supply of timber, fuel, etc, as well as for improving the climatic conditions All our efforts for the protection of forests will go in vain if we cannot educate the people about the beneficial role of forests

Two Five-Year Plans have been completed and we are now on the threshold of a much bigger Plan which envisages a balanced development of all the resources of the country The schemes in the Forestry Sector are long-term ones and their implementation will yield fruits in the distant future It is for this reason that the need for creating consciousness about the future possibilities of this National Wealth is greater than ever.

I am given to understand that the Centenary celebrations will include mass Forestry-education through distribution of brochures containing information on forestry and forest administration It is a happy augury for the nation that such a great need for publicity has synchronised with the country-wide celebrations

Technical staff that are directly in charge of management of the forests will, no doubt, take this opportunity of making an appraisal of the results of the steps taken by their distant predecessors in the course of the last hundred years I appeal to them to give due regard to the course of action indicated by at least those works of the past which are found to be in harmony with the needs and requirements of the present day world

A great deal remains yet to be done for bringing our forestry on a par with that of the more advanced nations of the world Determination, diligence and perseverance are required to continue this extremely beneficial task There may be frustrations and obstructions But these should be considered incidental in the crusade for any good cause

Let the foresters all over India march forward into the second century of scientific management of the forests of our country with courage in their hearts, faith in their mission and hope for a bright future.

MESSAGE FROM SHRI ALGU RAI SHASTRI, VAN MANTRI, UTTAR PRADESH, DATED 22ND JULY, 1961

It is a matter of great satisfaction to note that the Forest Administration in India has completed 100 years of its existence 100 years in the life of the forest is not a very long period In fact a single generation of trees often takes more than a century to grow to maturity The development of forests is, therefore, a process of centuries Yet the strides taken by the Forest Administration during its first 100 years have no doubt been spectacular Effective control of the evil practices of wanton destruction of trees, introduction of scientific management of forests which envisages the forest stock to continue in perpetuity, fire conservancy, survey, initiation of rationalised uses of forest products, seasoning and prophylactic treatment of wood, uses of diverse indigenous products in place of those imported from foreign countries, etc, have proved extremely beneficial to our national economy

I am happy at the role played by the Uttar Pradesh in stimulating forestry development of the country The first forestry school in India with an inter-State bearing was established at Dehra Dun in 1878 by the Government of the then North-West Province The administration of this school was taken over by the Central Government in 1885 This institution has a proud record of not only having trained large number of Forest Rangers and Officers from various States of India and neighbouring countries, but also of having since grown into a renowned international centre of forest training and research under the name of the Forest Research Institute and Colleges The varied forest types of Uttar Pradesh and a vast variety of its products have had a vital part to play in the development of scientific forestry in India They have lent ideal conditions of field education to many generations of students of forestry and a vast field for the activities of the research workers

A great deal, however, has yet to be achieved by way of further development of our forests Along with the planting of more trees, we have to adopt means of intensification of production with the object of self-sufficiency in timber, fuel and other raw materials Along with other measures with this end in view, a scheme of Farm Forestry has also been initiated in the State Third Five-Year Plan This schemes aims at making the villagers self sufficient in their requirement of fuel and timber for domestic use and will also enable them to divert the cow dung to the fields as manure instead of burning it in their hearths For the little time I have been at the helm of the forest administration in Uttar Pradesh, I have had occasion to see some of the development and other activities of the Department and I am confident that the Department will continue to live up to its past traditions and serve the people in an ever increasing measure

On this occasion I extend my most warm greetings to all ranks of forest personnel in India and appeal to them to make all efforts for the improvement of forests and forestry.

MESSAGE FROM SHRI BAJRANG BAHADUR SINGH BHADRI, LIEUTENANT GOVERNOR, HIMACHAL PRADESH, RAJ NIWAS, SIMLA-4, DATED 4TH JULY, 1961



I am glad to learn that a book on Indian Forestry containing comprehensive and up-to-date information about forests in our country is being brought out on the occasion of the Centenary of the Forest Departments which will be held in 1961

Forests, besides providing employment for about a million of our countrymen also help in conditioning the weather, in preventing soil erosion and maintaining the physical conditions of the country Indian forests contain various types of forest vegetation according to the climate, soil, its level and other local conditions Forests are also a source of considerable wealth to the country as they yield valuable timber, fuel, medicinal herbs, etc.

It has become essential now to preserve the forests, specially those forests which form watershed areas of majo
country and it is a
direction have already been taken by the respective State Governments

According to the National Forest Policy, 60 per cent area of the land in hills and 20 per cent in the plains must be maintained under forest growth Attention, almost throughout the country, has been paid towards re-conditioning forests so as to check the mobilisation of deserts, encroachment of sea-sands on coastal tracts and soil erosion in general

I hope this publication will stimulate greater interest for the preservation of forests and the data which will be supplied by this book will serve as a valuable guide to those who are associated with Indian Forestry and its future plans

ARGENTINE REPUBLIC

NATIONAL EXECUTIVE POWER, STATE SECRETARIAT OF AGRICULTURE AND LIVESTOCK, NATIONAL FORESTRY ADMINISTRATION

On the occasion of the celebration of the First Centenary of the Indian Forestry Administration, the NATIONAL FORESTRY ADMINISTRATION transmits to the same, its warm greetings, on such a happy event

One must recognize that during this century, an important forestry action has been carried out, which transcends the boundaries of that country

The forestry works, the improvement of the techniques and all that which constitutes the progress of the forestry activity, has been due, undoubtedly, to the efforts made by the forestry technicians of India and to the tenacity shown on more than one occasion

The similarity of ideals, the daily fight to place our forestry services at the height of the best in the world, the constant research and the field life in the virginal forest to reach a better forest development make us feel brothers to the foresters of India

The NATIONAL FORESTS ADMINISTRATION, National Forestry Service of the Argentine Republic, wishes to join on this opportunity to the rejoicing of the Indian colleagues and wishes them, as up to the present, the best of successes in their tasks

ELIAS DABAS
Agronomical Engineer
Administrator General of Forests

BUENOS AIRES,
October 1960

AUSTRALIA

FORESTRY AND TIMBER BUREAU

This Bureau is most interested in the completion of a century of creditable forest work in India, and I would like to suggest the following as a congratulatory message :—

"The Indian Forests Service was the first of the Great Forest Services of the British Commonwealth of Nations and the initials "I F S" listed in connection with a name or publication command well-earned respect throughout the World

The Founders and early leaders of the Service not only started significant scientific forestry in tropical or near-tropical areas, but they also commenced training schemes at professional and sub-professional level, which have had a profound influence wherever forestry is practised

The magnificent Forest Research Institute at Dehra Dun has done splendid research work and trained a fine Service Its publications are renowned While Dehra Dun may be the symbol of Indian forestry, it would not be so significant were it not for the devoted foresters who manage the woodlands of the States of India and maintain the series of experimental areas that are the basis of so much of Indian forest practice

The foresters of Australia congratulate the Indian Forest Service for a century of splendid achievement and wish them well in the years that lie ahead"

CANBERRA, M R JACOB
May 27, 1960 *Acting Director General*

CANADA

DIRECTOR, FORESTRY BRANCH, DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

It is a great pleasure to offer to the Indian Forest Service the sincere congratulations of the Forestry Branch of the Department of Northern Affairs and National Resources of Canada, on its magnificent accomplishments during the past one hundred years

Since its foundations were well and truly laid by such men as Sir Dietrich Brandis and Sir William Schlich, the Indian Forest Service has built up a record of progress and of service to the nation in the truest sense of the word, which is unsurpassed The steady evolution of a forest policy, which pays due regard to local as well as to national needs, has attracted world-wide interest Forest research and forestry education have grown steadily in response to the demands of the forest administrators for additional knowledge and for an adequate supply of well-trained men to use it

Canadian foresters recall with pleasure the visit of Messrs Chaturvedi, Ranganathan and Banerji to this country in 1952, on the occasion of the Sixth British Commonwealth Forestry Conference I am sure that all members of the forestry profession in Canada will wish to join with me in extending to the Inspector-General of Forests and his colleagues the best of good wishes for still greater progress in the years to come

OTTAWA,
June 20, 1960

J. D B HARRISON
Director

CZECHOSLOVAKIA

EXCERPTS FROM A MESSAGE RECEIVED FROM THE DIRECTOR OF ADMINISTRATION OF FORESTS, MINISTRY OF AGRICULTURE, GOVERNMENT OF CZECHOSLOVAKIA

Please accept cordial greetings from Czechoslovak foresters and all the Czechoslovak people together with their sincere congratulations on the occasion of the celebrations marking the centenary of systematic scientific administration of your forests

The people of our People's Democratic Republic follow with joy and deep understanding the economic development of your country, which reflects itself in the whole national economy including the production of timber

Czechoslovak foresters follow your development for yet another reason they too strive for the improvement of forest administration In our country, forests are considered not only an important source of raw materials, but also an integral part of our countryside and, therefore, deserving full protection In our socialist State, forests do not only provide timber, but are an important factor of major influence from the point of view of climate and hydrology of Central Europe Forests in Czechoslovakia are of great importance, especially as regards the equability of outflow of water, because our country is a region containing the sources of many European rivers Our Republic produces annually more than 10 million cubic metres of timber on the area of over 4 million hectares, meeting fully the requirements of our wood industry and the programme of construction By increasing the industrial production and by the large-scale construction programme of our State, i e, the industrial and housing construction programme, the aim of which is to raise the living standard of the people, the demand for timber is rising The State sees to it that wood is used economically and, wherever possible, that it is replaced by plastics which are supplied in an ever-increasing variety by our advanced chemical industry

This enables, despite the growing industrial production and the construction programme, to

cut down timber production every year in order to save woods in Czechoslovakia and enable them to fulfil properly other important functions in the creation of pleasant environment for man, climate, protection of the soil against erosion, fulfil their hydrological function and retain their importance in the defence of the country

There is no citizen in our country who would not be aware of the importance of forests Systematic propagation and annual celebrations under the slogan "April—the Month of Forests" help in creating the correct attitude of citizens towards forests, so that they consider them as national property and feel it their duty to protect them The fact that there are no forests in our country in the hands of big land-owners is a factor conducive to the creation of such an attitude Excluding a negligible part of small forests owned by farmer-members of co-operatives, all forests are under the State Forest Administration But also small forests owned by farmers are under expert supervision of the State Forest Administration in order to ensure that they are properly taken care of, and to secure the production and purchase of timber by the State

Forestry has made great strides forward in technique and mechanization In timber production, which previously depended solely on handsaws motor-saws have been introduced, and for transport of timber, trucks and tractors of home production have been used almost without exception By a suitable transport network and division of forests into sectors the Czechoslovak forest administration also tries to mechanize the transport of timber from the place where trees are cut down to the place where they are picked up by trucks The forest administration has also successfully tackled the problem of clearings and thin wood areas, partly caused by natural disasters which occurred over the past 20 years

Our Republic tackles also the big tasks of protection of nature and forests A special governmental committee has been set up to improve the agricultural, hydrologic and forest administration and to prevent any devastation of the country which may occur in connexion with production in these fields, as well as any harmful effects of exhalations, waste waters, dust and ashes of the speedily developing industrial production

We wish you, dear Indian friends, that your country be a flowering garden with happy people and children who will enjoy and profit from your forests

We are convinced that you have every prerequisite for it a beautiful and rich country and diligent and hardworking people to whom we wish to extend once again our congratulations on the occasion of such an important anniversary of Indian forestry

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FOOD AND AGRICULTURE ORGANISATION, UNITED NATIONS

The occasion of the Centenary of Forest Administration in India is, indeed, a milestone not only in the history of India but in that of international forestry The growth and development of forestry in India has been the object of interest and admiration not only in the countries of the East, but in very many other parts of the world, this is particularly so in the case of the Forestry and Forest Products Division of F A O

India has been faced by many diverse and often acute problems in the field of forestry These problems have been tackled by the Forestry Administration with skill and foresight In this context, I cannot let pass the opportunity to mention the Forest Research Institute at Dehra Dun, to whose past and present staff this success has been so largely attributable

I would like to convey to the Forest Administration the warmest wishes on my own behalf and on that of the members of the staff of the Forestry and Forest Products Division of F A O for the celebration of the Centenary of the Forest Administration and for the continuation of its great work in the future

EGON GLESINGER
Director
Forestry and Forest Products Division

ROME,
June 24, 1960

GHANA

CHIEF CONSERVATOR OF FORESTS

The influence of forestry in India during the past hundred years has not been confined within her borders, great though the effects within them have been India was the first of the then British Dependencies in which the importance of scientific forestry was realised and the appointment of Sir Dietrich Brandis as first Inspector-General of Forests was one of those ordinary decisions which were in fact epoch-making

It was natural that when the importance of forestry to the public well-being was realised by the Administration of other dependencies, it was from the established and growing Indian Forest Service that advisers and personnel were sought The majority of the old British Colonial Forest Services, including that the Gold Coast, new Ghana, were established upon reports by distinguished members of the Indian Forest Service, and their forest policy, administration and tentative silviculture were based on those already found suitable and fruitful in India So that India may fairly claim to have mothered the Forest Services of a great majority of the members of the British Commonwealth

Its influence did not end there, however When the United Kingdom very belatedly realised the need for University Faculties of Forestry, it was again to the Indian Forest Service that resort was made for Professors and Lecturers, so that for fifty years Forestry undergraduates of the Commonwealth have sat at the feet of teachers whose practical experience was gained in India and who drew most of their examples from there The tenets of Indian forestry may well be said to have permeated the development of forestry throughout the Commonwealth, though many of the practitioners never had the opportunity of seeing in person the magnificently managed forests of India

It is only in the last decade that things have changed and Ghana, for instance, is developing silvicultural techniques particularly suited to her forests, but they still rest on the basis which was so thoroughly pioneered in India

One hundred years in forestry is only in many cases a crop rotation, so that the final fruition of action initiated in 1861 has only now been attained, but it is a continuing process and India can look forward to the coming century with the knowledge that her forests are being continually developed and their productivity is steadily increasing

ALISTAIR FOGGIE
Chief Conservator of Forests
Ghana

ACCRA,
July 9, 1960

INDONESIA

REPUBLIK INDONESIA, KEMENTERIAN PERTANIAN, KANTOR PUSAT

It is a great pleasure for me to forward my sincere congratulations to the Forest Service of India on the occasion of the Centenary of its Forest Administration. Although in terms of forestry one hundred years is not something extraordinary, but concerning the development of a forest administration it can mean something important This is the case with Indian Forest Administration, which can proudly look back upon its history of development and advance It has indeed contributed a great deal to the treasure of experience and knowledge on tropical forestry I am sure the Indian Forest Service will continue to play its significant role in the advancement of tropical forestry, in particular in the Asian and Pacific region

IR SOESILO H PRAKOSO
Director General
Directorate of Forestry and Land Utilization
Indonesia

DJAKARTA,
July 9, 1960

INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES COMMISSION ON ECOLOGY

India, with its contrasts of climate and soil, possesses a unique variety of forest types ranging from tropical evergreen forests in the Western Ghats to the coniferous forests of the high Western Himalayas The forests of India are justifiably world-famed for the richness of their wild-life, particularly for the larger mammals, such as tiger, panther, elephant, bison, lion and rhinoceros, but their importance as sanctuaries must not be under-estimated Although large areas of forests have been cleared for cultivation, particularly on the plains, and some forests are still subject to shifting cultivation, much timber-covered land remains and several forest sanctuaries have been established Forest sanctuaries with their scenic beauty and attractive wild-life must provide relaxation and recreation for the Indian people The effective conservation measures taken by the Indian Government to protect the Great Indian Rhinoceros, *Rhinoceros unicornis*, provide a good example of its interest in safeguarding the indigenous fauna and flora and of its acceptance of the international responsibilities for wild-life preservation

Traditionally, besides providing timber and food, forests also protect the soil and water resources which are so essential to the welfare of a country Past exploitation of the hill forests has resulted in the loss for human use of valuable land by flooding and erosion, but the dangers of unwise use of forest land are now well recognised Reafforestation schemes are already improving devastated areas and preventing further destruction of human settlement by wind or water-carried sediments, for the protective influence of the forest go far beyond forest boundaries

The Commission on Ecology of the International Union for Conservation of Nature and Natural Resources fully recognises the importance of the past contribution made to conservation practices by Indian forests and foresters and, in this centenary year of forest administration in India, looks forward to their future role and impact upon world wide conservation

BRUSSELS, 4 *November* 28, 1960

The I U C N Commission on Ecology

IRAN

FOREST ORGANISATION

I consider it a great pleasure to convey, on my own behalf and on behalf of the employees of the Iranian Forest Organisation, hearty congratulations to the forest officers of our friendly country, India, for their valuable efforts during this one century in the preservation of this great national asset and for effecting great improvements in the technique and methods for the utilisation of the forests, and further to mention that happily during the recent years our cultural links have extended to the field forestry and to the old School of Forestry, Dehra Dun, as well It is hoped that by sending students on scholarships to this Institute these links become closer and will be beneficial to the preservation of forests I request you to convey my own and that of the engineers and other employees of the Iranian Forest Organisation sincere and warm greetings to the Principal, School of Forestry, Dehra Dun I pray to the Almighty to grant you and all other employees of the Indian Forest Organisation success in the discharge of their great responsibility

BRIG ALI KHAWAJA NOORI

Head of the Iran Forest Organisation

TEHRAN,
September 7, 1960

ITALY

MINISTRY OF AGRICULTURE AND FORESTS, DIRECTOR GENERAL OF MOUNTAINS (ECONOMY) AND FORESTS

For the celebration of one of the Arbor Days in Italy, the first after the War, an Indian representative from FAO, during a ceremony in Rome, made a speech so suggestive and so deep that all those who had the opportunity of listening to him were so much impressed that they will remember it for ever The foresters in particular were very much attracted towards their Indian colleagues, who love trees so deeply and appreciate their precious function in the natural processes and in the evolution of civilizations

In international meetings, I have often received confirmation of this spirit and I have kept a happy remembrance of our colleagues and friends of the Indian Nation

I am, therefore, extremely pleased to express to all the members of the Forest Administration of India, on the happy occasion of its Centenary, the warmest sympathy of all the members of the Italian Forest Administration, as well as our sincerest wishes that its activity be constantly fruitful and successful

The work of us, foresters, is undoubtedly a type of work which unites all of us in the whole world, as it serves the same purpose, raises the same problems and leads everywhere (by the glorification of nature through trees, which are her most complete expression) towards peace and prosperity among mankind, by offering continuously an indication and a suggestive symbol of that order and equilibrium which is the harmony of the Universe and which stands as a foundation of every true civilization

Accompanied by this feeling, which I know is so deep and alive among Indians, the wishes of the Italian foresters to their colleagues are a sign of solidarity and an encouragement for a close cooperation, meant to be an act of faith in brotherhood of peoples towards civilization

ALBERTO CAMAITI
Director General of Forestry
Italy

ROME,
June, 1960

MALAYA

FOREST DEPARTMENT, FEDERATION OF MALAYA

I am glad to learn that the time has come for the Forest Department of India to celebrate the centenary of its establishment Its progress has proved so successful that I greatly appreciate the privilege extended to me in the way of letting the department have a congratulatory message for this memorable occasion It has already established its reputation and I am sure it will enhance further

The work which was started by the first Forest Officer in the last century leavened the expansion that India can now enjoy the fruits of his work At the same time I take the opportunity to congratulate every member of the department at this propitious moment for their continuous cooperation which contributed to the progress and development so far achieved.

It is interesting to look back and see what the early foresters had in their mind They believed, as we do now, that their first duty was to maintain enough land under forest to prevent erosion, to maintain water supplies and to preserve climatic conditions, especially rainfall, and their second duty was to ensure for the people an adequate and permanent supply of cheap timber firewood and other forest produce

Although the close touch between Indian and Malayan forestry was established as far back as 1898 with the Calcutta Herbarium, the visit of Mr H C Hill, I F S , who toured Malaya, did not take place until 1900 Mr Hill submitted a report on the system of forest administration then existing and offered some suggestions by recommending, among other things, the future management of the Malayan forests and the formation of a separate department of forestry As a result, Mr A M Burn-Murdock was appointed as the first head of the Malayan Forest Department in 1902

The link was further strengthened with the appointment of Mr G E S Cubitt, also of Indian Forest Service, as head of the Malayan Forest Department during 1915—29 During the tenure of office of Mr Cubitt the foundation of modern forest research, both in this field of silviculture and forest products, was laid in Malaya.

In conclusion, may I express that, when India's resources are taken into account her record to date in various branches of the department's work is a good one

MOHD ALWY BIN HAJI SULEIMAN

KUALA LUMPUR, *Chief Conservator of Forests*
May 28, 1960 *Federation of Malaya*

NEW ZEALAND

DIRECTOR GENERAL OF FORESTS

It is with pleasure that I offer good wishes from the New Zealand Forest Service as you celebrate 100 years of forest administration in India We have heard, at international meetings and through visits to your land, of the tremendous pressure on your forest resources and on the men of the forest administration, who have been called to do a forestry job on a really grand scale We have heard how short dry fuel is in India, that your wonderful wild-life is vanishing as there is greater human ingress in rural forests, that forest land has had to give away its trees in places where only the forest cover held back soil erosion and aridity, and that new timber plantations must often be grown on inhospitable sites yet with fairly refractory species

But we have heard, too, of the deep respect among many dignitaries and officials for forests, and the lively devotion of forest officers towards planting and husbanding extensive new plantations This respect and devotion, and the dynamic forestry ideas already existing in your five-year plans, will ultimately create a great amount of wealth and abundance from forests, such ideas are in a way symbolised in your national flag by the Dharma Chakra and the green band, which have been said to be a sign of dynamic force and the people's relation to the plant life on which all other life depends

Rather than being one science, the calling of forestry is more an art involving many sciences and philosophies, varying as these do from one part of the world to another, visits to different forestry countries are often helpful in evolving the soundest policy and development, the New Zealand Forest Service will always look forward to forestry visitors from your country who wish to be shown forestry practices, training and administration in New Zealand

ALEX R ENTRICAN

WELLINGTON, *Director-General of Forests*
December 16, 1960 *New Zealand Forest Service*

NORWAY

DET KONGELIGE LANDBRUKS DEPARTMENT, SKOGDIREKTORATET
DIRECTOR OF FORESTRY

I have been informed that the Forest Administration of India in 1961 has been in force one hundred years I will take this opportunity to congratulate the Forest Administration of India on the results which it has achieved, results which I believe have been of the greatest advantage for the forestry in your country

The Forest Administration has also contributed to promote the development of forestry on a world-wide scale through international co-operation in this field

At the same time I want to send my best wishes for further success in the coming years

A LANGSAETER

OSLO, *Director of Forestry*
June 9, 1960 *Norway*

PAKISTAN

INSPECTOR GENERAL OF FORESTS

I find myself in a privileged position to send this message, as for eighteen long years, I had the honour of being a member of the Indian Forest Service, whose contribution to the advancement of forestry would form a substantial part of the celebrations at the Centenary Starting from scratch, this Service covered the vast Indian Forests with Policy, legislation, literature and management which have given India the high position it occupies in the forest world The manner in which the new generation of foresters has maintained standards is most heartening, and I am confident that the challenge to the Indian forests posed by the demands of an every-expanding population, industry and development would be met effectively. For myself and on behalf of my colleagues in Pakistan, I wish Indian Forestry a bright future

TASDIQUE HUSSAIN

KARACHI, *Inspector General of Forests*
June 23, 1960 *Pakistan*

PHILIPPINES

REPUBLIC OF PHILIPPINES, DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES, BUREAU OF FORESTRY

The Philippine Bureau of Forestry salutes the people of India and India's Ministry of Food and Agriculture on the occasion of the Centenary of forest administration in their country

The importance of forests to every man is one fact on which all temporal ideologies seem to agree Wherever forests are, they faithfully play their beneficial role, even without any treaty with the peoples they serve

We, in the Philippines, have noted with interest the progress of forest administration in India The feat of the one hundred years of Indian Forestry must have been accomplished with the same indomitable spirit which has gloriously sustained the country in its monumental struggle for a place of dignity in the concert of tree nations

We are sure that Indian forestry, like the Indian nation, will be able to anchor securely to unyielding progress The Philippine Forestry wishes Indian Forestry eternal good luck

TIBURCIO S SEREVO

MANILA, *Acting Director of Forestry*
June 14, 1960 *Republic of the Philippines*

POLAND

DIRECTOR, HEAD OFFICE OF STATE FORESTS

On the occasion of the hundredth anniversary of the existence of the Forest Administration in India, I have the honour to send you my hearty congratulations on the splendid achievements in the organisation of Forest Administration and Forest Economy in India Forestry in India functions in conditions so different from those in Europe, that it frequently requires gigantic pioneer and inventive effort

From short and pleasant observations made by the Polish Delegation during the Fourth International Forestry Congress in Dehra Dun we have preserved and we have conveyed to the Polish public our ineffaceable impressions of the imposing development and high achievements of the science of forestry in liberated India.

On the occasion of the hundredth anniversary Forestry and Foresters in India, I am sending in the name of the Polish foresters friendly greetings for all Indian foresters and also wish that the forests in India may develop and last for the use of your liberated Fatherland

Knowing the unbreakable desire of the Indian nation for peaceful coexistence, I close with the motto

Long live peace among nations

Director

WARSAW, *Head Office of State Forests*
June 24, 1960 *Poland*

RUMANIA

EXCERPTS FROM A MESSAGE RECEIVED FROM THE DIRECTOR OF THE FOREST RESEARCH INSTITUTE, RUMANIAN PEOPLE'S REPUBLIC

The celebration of the centenary of the first attempt towards a systematic and scientific management of India's forests represents a homage paid to the first Indian foresters who laid the basis of conservation, tending and turning to account of the forests in your country This action is in accordance with the traditions of the Indian people, who respect and admire the legendary cedar and teak trees, which shadow the soil of your country and had witnessed the multisecular historical struggles of the Indian people

The Rumanian people and the Rumanian foresters understand very well the present problems of the Indian forest economy and follow with an ever-increasing interest and satisfaction in its achievements

During Indian Five-Year Plans much valuable afforestation and erosion control work has been accomplished, consolidating thus the part played by the forests in the national economy, and the function of the forests as a protection means At the same time, similar work was accomplished on a large scale in the Rumanian People's Republic, too

We are acquainted with the progress realized by Indian forest science, especially in forest botany, chemical seasoning of wood, resins and other minor forest products

The Rumanian people fully appreciate the fact that India spends a great share of the national income for the development of agriculture and silviculture improving thus the standard of life of the Indian people On this occasion we want to express our friendship towards the Indian people We hope that in the future the friendly relations between our countries will develop more and more in the spirit of peaceful collaboration and the struggle for preserving and consolidating peace

In honour of the Centenary of Forest Administration in India, the Rumanian foresters send a hearty greeting to the Indian foresters and wish them more success in the great work of formation tending and turning to account of the forests, so that Indian foresters should contribute more and more to the development of Indian national economy and to the welfare of the Indian people

D IVANESCU
Director of the Forest Research
Institute in the Rumanian People's
Republic Bucharest

BUCHAREST,
September 5, 1960

SOUTHERN RHODESIA

FORESTRY COMMISSION

1961 is a historic year in Indian forestry for it marks the Centenary of systematic, scientific forest management In retrospect, it is amazing what has been achieved in the hundred years

India's influence in forestry in the Empire falls under six main heads First and foremost must be the fact that many hundreds of forest officers in the Empire, and probably over 75 per cent in the dependent Colonies have been trained by men who served in the Indian Forest Service and, from 1895 to the present day consisted of Brandis Schlich, Stebbing, Troup and Champion These men laid down the basic principles of systematic forestry and all Commonwealth countries are deeply indebted to them

India pioneered the training of Rangers and Foresters when in 1878 she established the Central Forest School for Rangers at Dehra Dun.

While it is true that, for centuries in the United Kingdom, there were proclamations which aimed at preserving the forests and, to come nearer home, the Dutch East India Company issued "placaats" from the 17th Century onwards which aimed at preserving forests in the Cape of Good Hope, true forest legislation probably emanated in India Your Forest Law of 1865 was followed by the Forest Act of 1878 which, with amendments, remains in force today Most Commonwealth Forest Services have based their legislation on yours.

Most services today have botanists and ecologists on their staffs but here again India led the field with such outstanding forest botanists as Brandis, Gamble, Beddome, Kanjilal and Troup

The first systematic working plans were done in India They probably commenced with Connolly's work in establishing teak plantations at Nilambur and there must be few sylvics who do not know of the Nilambur Working Plan The standard set in India has been followed by most countries

Last but not least is your research work This came into its own in 1906 at Dehra Dun and has proceeded apace since then India's pioneering work in silviculture, forest entomology, wood technology, timber testing and seasoning, wood preservation, pulp and paper and minor forest produce has been followed by all Commonwealth forest services

You have had one hundred years of great success and if the second century period produces similar achievements your country's forestal record will be remarkable

The congratulations and best wishes of all members of the Southern Rhodesia Forest Service are cordially sent to the Inspector-General of Forests and all of his staff

SALISBURY, G M McGREGOR
June 30, 1960 *Director of Forestry*
Southern Rhodesia Forestry Commission

SPAIN

DIRECTOR GENERAL OF FORESTS, GAME AND RIVER FISH

On the occasion of the centenary of the Forest Administration of India, I, on my own behalf and on behalf of the General Directorate of Forests, Game, and River Fish as well as Spanish forest departments, send our friendly felicitations and best wishes for the future of the Forest Administration of India and its technicians Spain, which has been making great efforts to conserve and improve its forest heritage and which has afforested nearly fifteen lac hectares in the past twenty years appreciates the meritorious efforts of the Indian Forest Administration in its hundred years' work in defence of the forest wealth of your great country, a wealth which constitutes without any doubt one of the greatest forest reserves in the world

SALVADOR SANCHEZ-HERRERAY CALLE
MADRID, *Director General of Forests*
September, 1960 *Game and River Fish*

SWEDEN

DIRECTOR GENERAL, SWEDISH BOARD OF CROWN FOREST AND LANDS

The Fourth World Forestry Congress held in Dehra Dun in 1954 gave the foresters of the West a welcome and practical opportunity to make a closer study of forestry in India I personally was unfortunately unable to attend, but delegates from Scandinavia have on various occasions spoken both of the respect of the progress of Indian forestry and of the many pleasant memories which resulted from the Congress The contact provided by the Congress in Dehra Dun was most interesting, particularly to the delegates from the North, working as they do under such dissimilar biological, climatic, geological and social conditions

In this connexion, allow me to mention a few figures from my own country 53 per cent of Sweden's land area is covered in forest The productivity of the forest land is relatively low because of the northerly situation, but since 97 per cent of the total timber stock is made up of only three tree species its utilization is simplified most considerably Figures supplied at the 1954 World Congress told us that India's forest area represents 23 per cent of the total land area, and that the productivity of the enormous rain and monsoon forests is extremely high compared with Sweden, where the average rotation for the Norway spruce and Scots pine forests is 100 years Swedish forests have for more than a century been highly industrialized—an absolute condition for prosperous forestry The marketing of timber has been improved little by little during this period In India, which has had more difficult technical problems to contend with, it appears that the task of utilizing the great forest and bamboo resources is on the way to being solved. It is with pleasure that we in Sweden watch the way in which the forest industry in India is growing into a mighty factor in the support of your country

When, in conjunction with the 100th anniversary of the administration of India's forests, I am enabled to send greetings from Sweden, I can do so as the head of a State forest institution—the Swedish Forest Service—whose term of administration is but one or two years longer than India's We in Sweden still take pleasure in the visit which was paid by

the Indian head of FAO, Director-General B R Sen, in conjunction with our 100th anniversary On that occasion he was kind enough to utter words of acknowledgement for the advice, concerning both forestry and the forest manufacturing industry, which, particularly since World War II in the spirit which characterizes the endeavours of the United Nations Organization, Sweden was able to supply to among others Indian foresters It is a source of satisfaction to us in Sweden that we have perhaps in this way made a contribution—albeit small—to the improvement of democratic co-existence

The Swedish Forest Service was created in 1859 to administer the State forests Today, the Forest Service administers on behalf of the State 10 per cent of Sweden's current forest wealth However, forestry is more laborious in the northerly parts of Sweden, where almost 90 per cent of the State forests are situated, for which reason the Forest Service bears the responsibility for an appreciably greater share of the work provided by the Swedish forests We consider it one of the State's main tasks to be able, through the Forest Service and on a nation-wide scale, to pursue effective experimentation and instruct others how forest management is carried out by the most longlived of forest owners, and simultaneously to contribute to the development of forestry from within—in extremely close co-operation with other forest owners As far as area is concerned, 50 per cent of the forest owners consist of farmers and other private persons, 24 per cent of forest companies, 20 per cent of the State through the Forest Service and 6 per cent of other forest owners

For the last fifty years of the more than 100 during which the Forest Service has administered the State forests, work has been concentrated more and more on the task of running the State forests on a commercial basis without jeopardizing stability and endurance It is hoped that in the long-term, as has been the rule in the last few decades, the forests will be able to give a good yield Another major aim is that the Swedish Forest Service will be able to provide the Swedish forest industry with a reasonably smooth supply of timber, and a considerable proportion of these engaged in forestry with a good and reliable livelihood

However, these intentions cannot be realized to best advantage unless we look beyond our national boundaries Despite the often radical differences which characterize the various races of the world, we have grown very close to one another in latter years We also know that no race can live and develop entirely on its own, we must all be aware of our common responsibility regarding assistance and welfare, and cultural and technical progress Foresters the world over have in this respect and advantage over many other groups, our common problems are not of a controversial nature, but prompt us instead to seek the answers to our questions in co-operation with each other, well aware that this method is most advantageous to us all

It is in this spirit that, on the occasion of this jubilee, I convey the greetings of the 1,700 officials and 12,000 permanently employed forest workers of the Swedish State forest industry, in the fond hope that the Indian forest industry and its many employees of various categories will enjoy a happy and successful future

ERIK W HOJER
Director General, The Swedish Board of Crown Forests and Lands

STOCKHOLM,
October 17, 1960

UNITED STATES OF AMERICA

UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE

I congratulate you on the notable progress made in Indian forestry during the past century India pioneered in tropical forestry, and its influence spread to other parts of the world, including the American and African tropics Many foresters from many countries have profited from your experience In the early years of forestry in the United States, Indian experience in forest administration was drawn upon by Gifford Pinchot and other leaders in developing American forestry institutions In fact, Mr Pinchot once said that the Indian forestry terms "forest conservancy" and "forest conservator" suggested American use of the term "conservation" in connection with what became the conservation movement in this country Indian forestry over the past century has contributed much, not only to the welfare of India and Southern Asia, but to the world at large

I send best wishes to the Indian Forest Service for its success during the coming century and a continuing record of accomplishment

WASHINGTON, D C
May 24, 1960

RICHARD E Mc ARDLE
Chief, Forest Service

UNION OF THE SOVIET SOCIALIST REPUBLICS

MESSAGE OF GREETINGS OF THE FORESTERS OF SOVIET UNION TO THE FORESTERS OF INDIA ON THE OCCASION OF THE CENTENARY OF FOREST ADMINISTRATION IN INDIA

The Forestry and Agro-Foresters Section of VASKHMIL send their hearty greetings to the forestry specialists and workers of India on the occasion of the Centenary of the Forest Administration of India

The traditionally friendly relations between the peoples of the Soviet Union and India trace back to centuries These relations have always served to strengthen the cultural and economic unity of the peoples of our countries Favourable conditions for the development of friendly relations and contacts between the U S S R and India were created only after the proclamation of India as an Independent Nation on 15th August 1947 and particularly after India became a Sovereign Republic on 26th January 1950

It is well known to Soviet foresters that the foresters of India have carried out titanic work for the liquidation of traces of proprietorship in the forest land left by the colonialists Indian foresters are taking great care to preserve and increase the forest wealth of India We Soviet foresters are in full agreement with the slogan of Indian foresters "Tree means water, water means bread and bread means life" We deeply appreciate the efforts of the foresters of India to renew useless teak forests, to make the most effective possible use of forest land, to control soil erosion, to effect the afforestation of treeless areas and the protection of the forest-economy of the country

Science plays an important role in the proper running of a forest economy Indian forest research workers who in the last 50 years have published more than 1000 interesting papers have rightly merited world-wide recognition

On the occasion of this great anniversary we, Soviet foresters, will be watching the development of scientific and practical forestry of India due to the persistent efforts of Indian foresters with the greatest interest and sympathy We sincerely wish the workers and scientists of Indian forestry all success in the noble task of raising the condition of Indian forests to the highest possible level

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WEST GERMANY

DIRECTOR OF FORESTRY AND TIMBER ECONOMY, FEDERAL MINISTRY OF FOOD, AGRICULTURE AND FORESTRY

On behalf of German Forestry I wish to convey my warmest felicitations on the Centenary of Forest Administration in India German Forestry considers it a great success that Indian foresters and scientists have managed by their untiring and methodical work to develop the present flourishing Indian Forestry from the first few seeds sown in India by German foresters at their time

When I visited India in 1956 on the occasion of the IV World Forestry Congress I saw with my own eyes the high state of forestry and forest research in your beautiful country I am firmly convinced that Indian Forestry has adopted the proper course in solving the particularly difficult forestry problems of India and for this work I wish you every success in the future

W. MANN
Director of Forestry and Timber Economy
Federal Ministry of Food, Agriculture and Forestry

BONN,
May 25, 1960

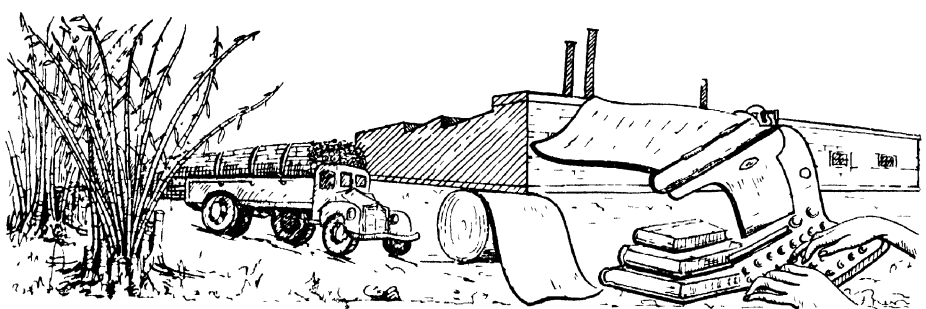


Reminiscences



Woodman, spare that tree!
Touch not a single bough!
In youth it sheltered me,
And I 'll protect it now

—**George Pope Morris**



UTTAR PRADESH 1903—1937

(BY F CANNING)*

There are not many left of this period, so perhaps some personal reminiscences may be of interest to those who have followed What a privilege it was to have served in the Indian Forest Service during these years and what a wonderful life!

Recruitment was through the Secretary of State for India and for the entrance examination vacancies were advertised in the English papers as for the "Woods and Forests" There were nine vacancies in our year and about thirty candidates at the examination We were trained for three years at Coopers Hill under the celebrated Dr Sir William Schlich A tour, conducted by him through the German forests towards the end of our course, was a lifelong example of what a tour should be It made one realise that the science of forestry as recorded in text books was based on long years of practical experience and the forests provided living illustrations of what we had hitherto considered rather as theoretical propositions

Postings to Provinces in India followed in practice the order attained in the training course Our U P Province was a favourite, considered more advanced in Forestry than others and healthier and so it attracted the higher placed students This almost certainly had some effect on the rate of progress in the U P forests The honours obtained by U P forest officers were also noteworthy Four of the Conservators, Mason, Glover, Howard and Champion, of the time when I was Chief, were subsequently knighted and two of them were Inspectors-General of Forests But perhaps the honour giving the greatest pleasure was that the first Indian Inspector-General of Forests, Shri M D Chaturvedi, was chosen from the U P

To present officers, the pace of promotion early in the century must be a surprise In my own case a year and a half as Assistant, thirteen years in Divisional charges, eleven in Conservator's posts eight as Chief and six months officiating as Inspector-General of Forests Admittedly my case was considered abnormal and unlikely to recur

Good luck favoured me at the start with my posting as Asstt in Kheri, then one of the best Divisions in Northern India under Clutterbuck (later Sir Peter C), an absolutely outstanding forester of this period

But with only fifteen months service it was very early to get one's first Divisional charge for a year in Bahraich Compilation of a Working Plan for the Division was also thrown in There were then no Working Plan Conservators and owing to illness in that year no one inspected in my forests



My first Circle charge was in my eleventh year of service in the newly formed Circle of Kumaon where I spent so much of my time Though one was not called a Conservator, the post carried all the usual powers of one, including direct contact with Government, as by then Chief Conservators had not come into existence From five years later in my sixteenth year, I became practically continuously Conservator, gaining experience in all circles except Working Plans

Eleven years as Conservator and then in my twenty-sixth year I started a period of over eight years as Chief including a short six months officiating as Inspector-General of Forests

* F Canning was a member of the Indian Forest Service, he was the Chief Conservator of Forests, Uttar Pradesh, 1929—1937.

Bahraich was a wonderful experience A very fine old Forest Ranger, approaching retirement, was my guide and mentor and a tremendous help to me, particularly as I had not had the experience of holding charge of a Range Shooting was very good and I put in on this any spare time I could make out in the forests Game was plentiful and tiger came in from the adjoining Nepal forests as soon as there was room for them in our forests Six tigers in the twelve months and six panthers and I could have had more but my programme for the field work of the Working Plan plotted out day by day for the whole season, carried on up to the rains and even a half day taken off made it that amount later

Back in Kheri—then all one Division—my permanent charge started with the drought of 1907 and 1908 The famine of those years marked an epoch in provincial history The suffering was very great, one in ten in our district were on the roll of relief But the famine arrangements were rather wonderful, works were arranged all over the affected areas and everyone went at it all out and red tape disappeared

The chief thing the Forest Department did was in addition to the hitherto usual throwing open of areas for forest grazing, the first supply of forest fodder grass, sent by rail to distant districts A special train load went off every day and during the moonlight periods the continuous clank of the grass hand presses day and night is something one still remembers This forest hay supply developed enormously in more recent times and Channer in the first World War and Symthies in a later famine were responsible for much of this.

The sal forests suffered terribly. 10,000 acres were killed and 55,000 acres very seriously affected in the Kheri Trans-Sarda forests, where the average fall in the subsoil water level was 10 ft and the maximum registered was a fall of 26 ft From being a model forest to which every year classes of Dehra Dun students were taken to see coupes round Matha, this tract was taken out of regular working for some twenty years

With all these dead trees about, fires became a very serious danger One's first big fire must always be a thing remembered My first was in the Trans-Sarda and extended twenty miles from the start near the Nepal border in the north-west to the finish on the railway line to Chandan Chouki There a counterfire, chiefly by a trainload of passengers, was just in time on the second day to head off the fire on the clearing specially widened that year owing to the greatly increased fire hazard This and other fires in the Trans-Sarda area (e g , 10,000 acres in one June night not far from Belraien) also necessitated revision of the Working Plan and reduction of the Annual Yield

One other result of these bad fires was to start consideration of introducing forest telephones to expedite control and incidentally all forest business A complete system was later developed by Carrington-Turner in the Trans-Sarda

It was a basic principle of the exploitation of our forests to consider the interests of the purchasers of our forest produce and to see that they made good profits After the famine year when our contractors had large unsold stocks Government refunded in Kheri about Rs 1½ lakhs of purchase money already paid, a lot of money in those days Most of this was used by contractors to finance the next year's working and the good-will established was very valuable

After eight years in sal forests it was a great change to be posted to the pine forests of Kumaon It was about this time that the Forest Department was, directed by Government, taking over the administration of the Kumaon forests Denudation in the more accessible areas was progressing at a rate dangerous to irrigation in the plains and harmful to agriculture in the hills Meanwhile in the more remote areas vast numbers of large pine trees were mature, dying and rotting away unutilised In Almora, Bhowani Datt Pant did most of the preliminary investigation and assessment of the exploitable areas and the earlier felling schemes were based on his work.

The introduction of control and systematic administration, so long delayed, was almost inevitably bound to give trouble If we'd had more experience in the early days, some of the trouble that occurred would have been avoided The Forest Settlement laid down the legal position, but its application had to be modified and progress limited to what public opinion would support The formation of the Kumaon Forest Advisory Committee of non-officials with the Commissioner and the Conservator as the only official members was perhaps the greatest step which led towards public appreciation of the value of these forests both to Kumaon and the Province Village Communal Forests managed by Panchayats were started and included many plantations whose value was mainly local Those near Almora were an outstanding example being taken over by the Municipality Towards the end of the period under description requests were being received for progress faster than was considered feasible.

Meanwhile, exploitation of the forests was proceeding rapidly The great increase in pine timber resulted in large departmental open-tank creosoting installations designed to treat over a million railway sleepers in three years The first world war interrupted this, but when, twenty years later, I was taken as Inspector General of Forests by the Railway Authorities on a tour of inspection of treated sleepers, these first early supplies were shown and considered some of the best received After the war the treating work was taken up by the Railways and the market for our pine timber confirmed

Resin tapping had been for some years in progress in the old reserves near Bhowali and Naini Tal In 1911, tapping was started in the Almora District forests giving 800 mds By the end of the first war, the outturn from Almora had risen to 80,000 Mds Perhaps the chief benefit from the work was the amount of money it brought into Kumaon as wages for tapping and carriage work Extension of roads and bridle paths preceded or followed naturally on these developments The study of "twisted fibre" in pines including the first recording of "right handed twist" in old trees and the introduction of controlled burning as a fire conservancy measures were important items of the period

Throughout the Province the watchword in forest matters was—progress The introduction of the new rank of Chief Conservator met a distinct need in Uttar Pradesh I remember when I had my first Circle charge, there were three of us, all dealing direct with Government and all at the time "officiating" Clutterbuck was our first Chief Conservator and from him came so many of the new ideas

Working Plans with Silviculture and Afforestation formed one new Circle and Utilisation another, my connection was mainly with this Trevor (afterwards Sir Gerald T) and Smythies were responsible for very much of the Working Plan Circle development Canal bank plantations were taken over by the Forest Department and a special Division dealt with eroded ravine country along the large rivers

In the Utilisation Circle, the Resin Distillery was moved from Bhowali in the hills to a new forest settlement near Bareilly which was named Clutterbuckganj There also was built a large Sawmill and Bobbin Factory with Broad and Metre Gauge access Later, the factories at Clutterbuckganj were turned into public companies In settling the terms of their promotion our aim was to establish the industries on a sound basis The Resin Distillery was an accepted success, little capital was required and the return aimed at was a 10 per cent dividend on this capital The terms were more or less fixed by Government and the results have been good, this dividend having been steadily maintained

The Sawmill and in particular the Bobbin part of the undertaking was by no means an established undertaking and we had to take what we could for it and then give support from time to time Good bobbins could be and were made but the quality of the available timber was not good enough and excessive wastage prevented financial success In the first World War, India was largely supplied with Japanese bobbins—though these were of unreliable quality I understand in the second World War, the Clutterbuckganj factory did meet a very great need in the country

For a time the Utilisation Circle took over the Carpentry School at Bareilly, developed it very much and carried out much experimental work in the use of our timbers Later, this was made over to the Industries Department I fought hard to keep it, but the loss was for me softened very much by the kind words used by Mr Chintamani, the very able Minister for Industries, when, after we had been in detail round the school, I was handing over to him A couple of months later, when the Director of Industries was unable to take the Chair at a meeting of the School's Advisory Committee, I was asked to take the Chair This school led to other schools including one in Naini Tal, where I helped in framing the syllabus

Various works were undertaken in the forests, narrow-gauge tramways in Haldwani and Gorakhpur, a large timber boom at Barmdeo on the Sarda and fair weather motor roads wherever possible The commencement of Game Preserves was another interesting development

Reservation and protection of forests must generally, and particularly in the early stages, involve some limitation of the amenities enjoyed by the people living near them Politically the Forest Department was liable to be and often was a target for attack In Kumaon, the breaking of forest laws including the burning of forests was the way resentment was shown on the spot, while voting reductions of the Departmental Budget occurred in the Legislative Council The consideration by the Kumaon Forest Advisory Committee of their part of the Budget before it was presented in Council was possibly the greatest factor in stopping these votes for reductions

At one stage, for a considerable number of years, the Chief Conservator sat periodically as a Nominated Member of the Legislative Council Answers to all questions went through his hands to the Member who had to make them in Council After introduction of the Forest Budget by the Member, the Chief was expected to speak to all motions for reductions and he also generally spoke when special Forest Resolutions were under discussion The contacts thus made were most valuable In the ten years' period that I had connection with the Legislative Council the progress that occurred was most noticeable There was plenty of criticism but it was friendly and constructive Long before I left it was possible to say without any reservation that "Forests" would be favourably and safely treated whatever powers over them were granted to any new form of Government Actually, the progress that has since been made is vast and more than we even hoped for in those days

My period as officiating Inspector-General of Forests was hardly long enough to do more than realise the possibilities of the post I tried to help on the Utilisation Branch as that was what I knew most about Ascu preservative was then new and under considerable criticism I still have some plywood boxes that were treated with Ascu over twenty years ago It did appear to me that the combination of the posts of Inspector-General of Forests and President of the Forest Research Institute was not satisfactory One had to give about one-third of one's time keeping in touch with the Government of India and other Departments at Delhi and Simla, a further third in touring by invitation various provincial forests, advising on problems This left quite inadequate time for residence at Dehra Dun and the direction of Forest Research

I have said how good fortune favoured me at the start in serving under Clutterbuck, it favoured me also by giving me my last months directly under the Premier of the Uttar Pradesh In earlier days, though I think our aims were always similar, we had not always been on the same side But as time went on, we got closer together, the Kumaon Forest Advisory Committee helped this very much I always remember his being chosen as the best man to represent Government in an arbitration case which concerned Kumaon and doing it with outstanding ability, with full access to all our records One of the things I felt very much in leaving India at the end of 1937 was severing connection with him At the commencement of the period 1903—1937 one could be said to have started as a Government official, by the end one was a Public Servant

WILD LIFE IN THE INDIAN FORESTS

(By F W CHAMPION)*

I have been requested by the President of the Forest Research Institute and Colleges to write an article on my reminiscences of life in the forests of India and it is with great pleasure that I do so, as some of the happiest moments of my life have been spent in those wonderful forests Although living, as my wife and I now do, in a beautiful part of Scotland, which should satisfy most people, we both at times are overcome by an overwhelming feeling of nostalgia for the glorious foothill forests of the Himalayas where we spent so many happy days among the wild animals inhabiting those fascinating areas

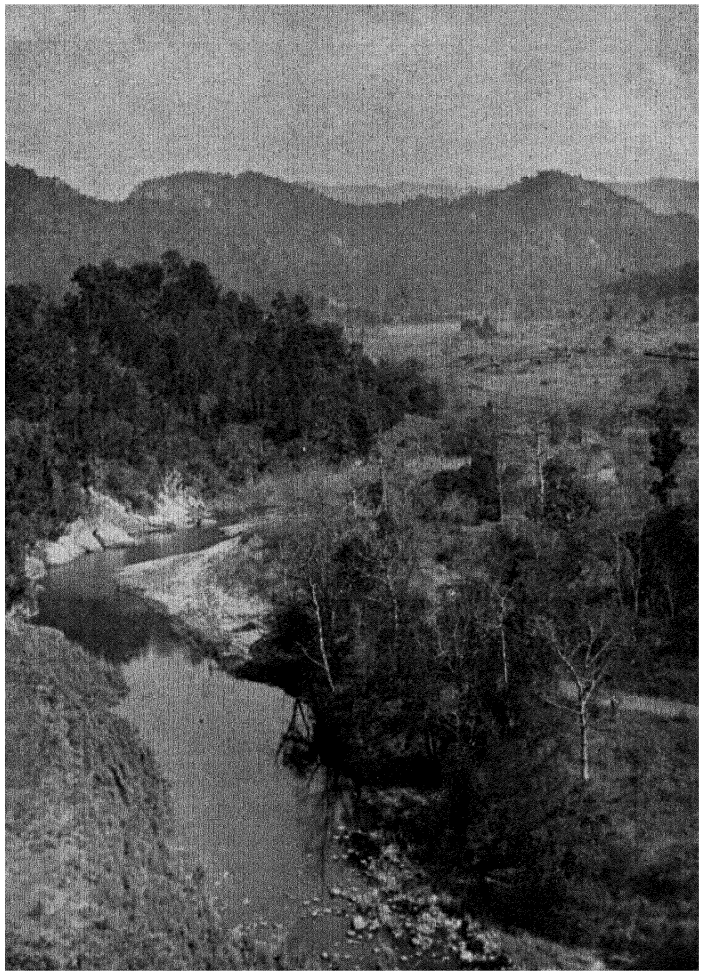
There are many foresters more competent than I to write about the scientific side of forestry in India, so I will say little about that, the most important aspect of a forester's work, except to note that subsequent experience of forestry in East Africa and in Britain confirms my original idea that our forests in India were managed well enough to compare favourably with management in many other parts of the world And now, after a century of scientific management the forests of India have become a priceless asset that must be the envy of many less fortunate countries

With these few introductory remarks I will now turn to the other aspect of the management of India's forests, and that is the provision of big game hunting, properly controlled and consistent with the preservation for all time of the splendid fauna that share the forests with us, foresters Some hold that game and wild life preservation should be in the hands of specialists in that line, but I think that the foresters of India can justly claim that they have looked after and cared for the wild life of the forests almost, if not quite as well as they have the forests themselves Indeed, there is much to be said for having chosen forest officers in charge of the wild life in their forests because the forest officer, sympathetic to the wild creatures that live in the forests with him, can fairly balance the needs of his forests against the inevitable damage done by some wild animals A few forest officers, desperately keen

*F W Champion was a member of the Indian Forest Service in Uttar Pradesh He was a renowned photographer of wild life



India's king of the Jungles
Copyright Photo F W Champion



Tiger country in Garhwal District
Copyright Photo. F W Champion

on natural regeneration, may feel at times that certain wild animals do too much damage to the forests On the other hand, the average game officer has no conception of the needs of the forests, which to him are merely the environment in which his charges live, whereas the conscientious forester feels that he is responsible for both the trees and the wild creatures in his charge and gives a fair deal to both

To most people the forests of India conjure up visions of "Tiger, Tiger, Burning Bright" and truly the tiger at home is one of the most magnificent sights in the whole animal creation I have often wondered why the lion has been called the "king of beasts" After I left India, I served for six years in East Africa where I had a good deal of experience of lions and all I can say is that, in my eyes at least, the lion takes a much lower place in beauty, magnificence and physical fitness than the striped king of the Indian jungles As an animal photographer, I found the lion in East Africa almost too easy to photograph, whereas it took me many years to obtain colour films of tigers—and how wonderful the colours of the tigers are in the beautiful Indian jungles compared with the drab colouring of the lions in the rather uninteresting plains of Africa! May the day be long distant when the tiger joins the all-too-long list of animals exterminated by man

One of the greatest pleasures offered by the Indian jungles is the chance to wander about on a well-trained tame elephant, especially in areas where wild elephants occur, because in such areas wild animals are not afraid of tame elephants provided they are properly handled Indeed, it is astonishing how a tame elephant can approach right up to within a few feet of a normally shy and alert animal like a sambar without the sambar becoming aware that there are hated human beings quietly sitting on the elephant's back Hunting, photographing or just watching from the back of a tame elephant in this way is quite an art in itself and teaches one much jungle craft, particularly when following up the alarm cries of deer, monkeys, peafowl and other birds These calls indicate the whereabouts of tigers and leopards and it is fascinating trying, with the help of these cries, to approach close up to the feline whose presence is causing them Sometimes, the tigers and leopards themselves roar in the jungles and it is possible to follow them about from their own calls Indeed, the only tiger that I ever shot—and I could have shot many had I so desired—was shot in this way I had spent perhaps two hours following a roaring tiger in the foothill forests without ever seeing it In the end I lost touch, so the Mahout, took my elephant up a small hill to have a look round for the tiger The latter must have had the same idea because, just as we reached the crest, we came face to face with the tiger coming up the other side He crouched, gazing at us in an interested way, and one could imagine him thinking "Fancy you also coming up this hill like me to have a look round" I lifted my rifle and fired and he fell dead instantly—a glorious living creature that had kept me thrilled for hours turned into a bloody carcass This was such an anti-climax to a wonderful experience that I lost all desire to kill tigers from that moment of climax to a successful hunt

Many of my friends, both Indian and European, have found it difficult to understand that from that moment, 35 years ago or more, I have lost all desire to kill wild animals Not that this has proved any loss to me because I have found that big game and wild life photography provides all the thrills and excitements of hunting without having to shed any blood at all Not only that but one can shoot any particular tiger, for example, once only, but one could, if clever and lucky enough, take one hundred photographs over a series of years of this particular beast and yet the hundred and first photograph might prove to be far better than all the previous efforts

As an example of the thrills that are possible for the animal photographer I will describe an experience that I had a good many years ago in Garhwal District of Uttar Pradesh—a district that runs from the lowest foot-hills up and up through the Himalayan mountains to the eternal snows, containing a wonderful and extremely varied fauna and flora and producing a splendid race of hill-men whose military prowess is such that they earned several V C's, Britain's greatest honour, in the course of the two World Wars The dense forests clothing the foot-hills of this district are one of the finest natural habitats for tigers to be found anywhere in India and I have always counted myself very fortunate indeed to have spent about 15 years of my working life in India in this chosen area, which I must have got to know as well as almost anybody

The experience I am going to describe took place in a somewhat remote valley that was not much disturbed by sportsmen and that was entirely uninhabited during the monsoon from June to October when the Forest Department removed its staff The result of these favourable circumstances was that the valley nearly always contained tigers and these tigers, being rarely hunted, were not as shy and cunning as most We therefore tried to visit this valley every year as

early as possible and before the forest contractors had brought in their labour to carry out tree and bamboo fellings On one such visit we found on arrival that a tiger had gone up the valley the night before and as we knew from past experience he was likely to come down again within the next two or three days, we set flashlight traps in the hope of taking his photograph on his return. The first two nights we drew blanks but the third morning, on going to see what luck we had had, we were disappointed to find tiger tracks coming straight down the road below the spot chosen for the flashlight trap wire This probably meant that the flashlight had failed or that the tiger had seen the wire and stepped over it When we reached the camera, however, we found that he had taken his own photograph, jumped into a stream-bed which he followed for a short distance and then returned to the road—tigers prefer to walk on roads or paths—as though nothing had happened

Later we found that he had continued down the road and had subsequently killed a buffalo bait tied up for him about two miles below He had taken his kill up a steep stream-bed, rather difficult to negotiate on a tame elephant, but we decided to try to stalk him with a camera in the heat of the day. We set off early in the afternoon and we had with us a visiting Forest Officer from Burma who subsequently became head of the Forest Department in that country and who has, alas, now left this world I had my reflex camera ready and my guest loaded a rifle in case of trouble We went slowly up the stream bed which was so rough that, good though our elephant was, we made so much noise that there seemed little hope of ever seeing the tiger Suddenly, however, the elephant raised her trunk indicating that she could smell something, and shortly afterwards we got a brief glimpse of the tiger, about 25 yards ahead, walking slowly up the torrent bed, having just left a small pool of water in which he had been lying and enjoying himself during the heat of the day There was no chance to take a photograph and just at that moment our elephant trod on a dry branch which broke with such a noise that we felt that there was no hope of seeing the tiger again, particularly as the country was too steep and rough for the elephant to be able to follow where he had gone The elephant stood still and we discussed in low voices what to do next for some little time While we were doing this, my wife saw a slight movement in the thick bushes above us and this proved to be the tiger directly above us and about 20 feet away. He was gazing down on the four of us seated on the elephant's back He was sitting on his haunches peering at us hard and opening and shutting his mouth from the heat After a while he got up, apparently satisfied that we were harmless and disappeared again up the steep stream-bed. Once more we thought that was the last we should see of him, but we were to receive a very pleasant surprise, for after a short interval we again saw him coming slowly down the stream-bed towards us, stopping occasionally to look at us He was hot and evidently wanted to return to the small pool in which he was lying when we first saw him and within a few yards of which our elephant was standing After a certain amount of hesitation he finally decided to do this, and coming right up to the side of the pool sat down with a heavy flop, obviously delighted to return to his cool and comfortable retreat There he lay, 12 yards away from us with his mouth open, his sides heaving, yawning heavily until his eyes began gradually to close with sleep Every now and then he opened his eyes to look dreamily at us but always came to the conclusion that we were boring if harmless intruders who were disturbing his afternoon nap

The lighting conditions were not good but during the next few minutes we exposed all the plates we had and still the tiger was lying there I personally had given up shooting tigers long ago but I was in a quandary as regards my guest I hated the idea of destroying this magnificent animal that had given us all so much pleasure and excitement It seemed pure murder but I knew that Dennis Atkinson had never shot a tiger and was keen to do so, so I forced myself to whisper to him that he could shoot it if he so desired He must have been badly tempted but to his extreme credit (and to my great relief) he managed to fight down the temptation and we finally decided to leave that tiger to live his life in peace so far as we were concerned

This experience shows what an advantage shooting with a camera has for those who are interested in the lives of wild animals Had we been out to kill, that tiger would have been shot when we first saw it and we should have missed all the thrills of a wonderful and unique experience such as few have witnessed. So far as I am concerned, it is very unlikely that I shall ever see the beautiful forests of India again, but I still have the photographs and memories which will remain with me as long as I live to console me when I realise, sometimes only too vividly, that my tiger-photographing days are gone and that I am now not so young as I once was.

ABSTRACT FROM "RECOLLECTIONS AND REFLECTIONS

(BY M D CHATURVEDI)*

How I wish I had remembered half the things I have forgotten. and forgotten half the things I have remembered—Asquith

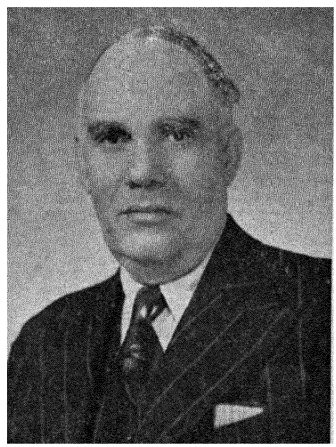
Centenaries are endowed with a mystic quality by the magic of numbers The romance of the hundred casts a spell on people to revel Unlike jubilees that provide a reason for rejoicing, centenaries give us a cause for a pause to ponder, and an occasion for circumspection

The foundations of the forest management in India go back to the turn of the nineteenth century when the Malabar teak and the Bengal tiger attracted the attention of the British For long years, both were considered inexhaustible The myth of sufficiency naturally engendered a sense of complacency

Taking a cue from their predecessors, the East India Company contended itself by declaring some valuable species like sal and *sisham,* teak and sandalwood as 'royal trees'—trees that required a permit to fell Otherwise everyone was at liberty to fell what he liked and where he liked The forest was regarded as an inexhaustible reserve for the extension of cultivation It was a planter's paradise, a hunter's dream, and a logger's monopoly The notion widely held about the inexhaustibility of the forest took the best part of fifty years to dispel

My own association with the Forest Administration in India goes way back to October 1919 when I joined the Bombay Provincial Forest Service The Indian Forest Service was then considered a British sanctum which none of us could profane In April 1920, I joined the Forest College at Dehra Dun which was then housed in the premises of the Doon School at Chandbagh I had hardly completed the first term when the Montford Act prised open the Indian Forest Service to Indians I found myself as one of the 4 least unsuitable candidates selected for training abroad In England our arrival caused unsavoury comments At the High Commissioner's Office, I saw the spectre of Cassandra foreboding the doom of the Indian forests because of us Professor Stebbing of Edinburgh availed himself of the hospitality of the London Times to expatiate upon the tragic consequences of Indianizing the Indian Forest Service

It was against this background that we four lost souls landed at Oxford. that home of all lost causes The Director of Forest Studies, Major A M Caccia, treated us kindly and made us his special concern The Professor of Forestry, Sir William Schlich, a retired Inspector-General of Forests of India, evinced particular interest in our welfare, R S Troup who succeeded Sir William thought no end of us Dr Farnel, the Rector of my college, Exeter, and the Vice-Chancellor of the University, was proud to have me as his ward He took an anthropological interest in my Braminism and vegetarianism I made many



friends and met some of the world figures in the field of forestry A Schwappach at Eberswalde, Karl Philippe at Karlsruhe, Muller at Bienne and Biolley at Neu Chatel

Oxford belied the prophecy of Cassandra At the end of our course only two got honours, both Indians And luck favoured me to find my name associated with the coveted Currie Scholarship of the year I stayed on for another year to do research work

Returning to India at the end of 1923, I joined service in the U P How un-English did the English appear in India Mr H G Bilson, the

* M. D Chaturvedi was a member of the Indian Forest Service. He served in the Uttar Pradesh and retired as Inspector General of Forests, Government of India

Chief Conservator of Forests, exhibited Pecksniffian concern over my intrusion Being the spearhead of Indianization of the Indian Forest Service, I had a hard time fighting deep-rooted prejudices, and found petty pin-pricks exasperating With the passage of time, as more of us joined the service, people reconciled to the inevitable and we learned to live and let live

But for the brief interlude when I strayed into the Rural Development Department as its Chief, I spent the best years of my life in the U P Teak and *taungyas* were the rage of the day, the regeneration of sal was a burning topic, and the challenge of the Jamuna ravines was looming large on the horizon The Turpentine and Bobbin factories at Bareilly were under transfer to the private sector, and a *katha* factory was just coming into being at Izatnagar

Among my contemporaries, I owe a debt of gratitude to Mr E A Smythies who gave me inspiration and direction It was his imagination that brought forestry out of its sylvan homes to the village lands, resulting in the creation of the Land Management Circle Other colleagues that stand out in my memory are Sir Gerald Trevor who is still affectionately remembered in the Kulu valley, Sir Herbert Howard who organized forest research with a flamboyant flourish and found his way into the pockets of forest officers with his famous pocket book, Uncle Arthur (A E Osmaston) who was so strict and fair that once he ticked himself off, H G Champion who covered the service with glory by his achievements at Oxford, his brother F W whose "Sunlight and Shadows" popularized shooting with a camera Henry Ford-Robertson whose brains threatened to go to his head, E C Mobbs who strove hard to catch up with his conscience, R N Singh whose gentle ways earned him the title of Gautam, Brahmawar who generally forgot to cash his pay cheques, saintly Sewal who had not heard of the word 'No', little Sen who achieved much and said little, Debi Lal Sah who knew all the answers, Jai Raj Singh who worked silently and generally thought twice before saying nothing and Negi who delivered the goods with infectious enthusiasm, I also recall a bloke called Chaturvedi who blundered through, with the courage of ignorance!

With the dawn of Independence, I took over the U P Forests as its first Indian Chief Conservator The British personnel left *en bloc* with the exception of Messrs Hopkins and Stephens who stood by us in the hour of our need Democracy was yet in its infancy It had found power, but no feet, it had vision, but no perspective, it lacked tradition and direction Strains were set up that loosened service discipline and disrupted esprit de corps My chief headaches arose from the resistance to the demands made on forest land, from refusal to allow unlimited grazing used as a vote catching device, and over postings and transfers

In 1949, I took over as the Inspector-General of Forests from Mr Hamilton During the 5 years I was in office, I had the benefit of advice of C R Ranganathan who was throughout the President of the Forest Research Institute at Dehra Dun In the schemes I sponsord and the projects I pursued I had his unstinted co-operation During that formative period, my main task was to impart a democratic orientation to the various bodies set up by the Government of India Thus, the Board of Forestry, the Board of Forest Utilization and Research were reconstituted with an emphasis on the association of the leaders of public opinion Non-Official support was particularly sought in the setting up of the Indian Board of Wildlife Thanks to the inspiration of Shri K M Munshi, research was initiated to meet the challenge of the Rajasthan desert Again, it was his vision that galvanized the tree-planting day into a national festival, the Van Mahotsava An outstanding achievement of the period was the re-enunciation of the Forest Policy of India It reflects the considered opinions of the Heads of various State Forest Departments, the handiwork of Ranganathan, and above all the brilliant advocacy of Shri Munshi

My last task was the organization of the 4th World Forestry Congress in December 1954 in which 45 nations took part The event is still so fresh in public mind that it does not merit a detailed description

No appreciation of the century that forestry has just scored in India would be complete without acknowledgement of the deep debt of gratitude it owes to Lord Dalhousie To Dr Dietrich Brandis we are beholden for his genius in giving forestry shape and direction

I would also like to associate myself with the eloquent tribute that the forests of India pay to the generations of foresters who nursed them with unflinching devotion

Our thanks are particularly due to the British foresters, specially to those early pioneers, who served in malaria-ridden tracts, and braved discomfort, disease and loneliness without modern medicine and means of communications Their dedication to the cause of forestry in India provides both an inspiration and an example for Indian foresters for all time.

REMINISCENCES OF SERVICE IN MADHYA PRADESH FORESTS

(BY R N DATTA)*

My first posting in the Forest Department was in Mandla District in the former Province of C P & Berar (now M P) In 1927, there was a 'war' on against the sal heart-wood borer and, like several other Officers, I found myself involved in it immediately after joining service An epidemic was raging in a very large area of sal forests in Mandla and the adjoining districts, which had already caused immense loss Borer damaged trees were being felled everywhere and utilisable timber promptly converted into sleepers and extracted The remnants were stacked and burnt during the cold season Bonfires were to be seen everywhere in the forests

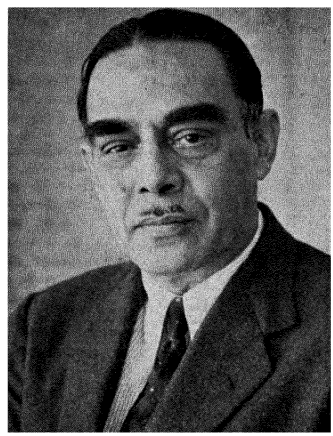
Communications were poor then, and touring had to be done on foot Camels carried the tents and kit In those days it was usual to tour in the forests almost continuously from about the middle of October to the latter half of June except for short breaks for Christmas and Easter

It fell to my lot to work mainly in the Banjar and Motinala ranges which are famous for the abundance of all kinds of game It was not unusual to come across three to four hundred *barasinga* at a time on *Sarvantal maidan* and, with some luck, to spot a tiger stalking *cheetal* or *barasinga* for a kill

Camping in the forest near Kanha I had the privilege of a visit from Mr Dunbar Brander who, after retirement, had come to India with a friend on a shikar trip in this paradise of big game This forest is now the famous Kanha National Park in Madhya Pradesh

The trap-tree method of destruction of the sal borer beetle in large number which had been worked out earlier in the adjoining district with the help of the Forest Entomologist was also adopted in Mandla I was asked by the Divisional Forest Officer to proceed to the forests in the latter part of June to start this work The trap-tree work and this tour were most interesting and exciting It was a novel experience to see, a short time after felling and logging a tree, hundreds of beetles flying to the logs and settling on the freshly cut ends from which one could easily catch and destroy them

On a very rainy evening the men carrying my kit failed to reach the camp (Motinala *F. R H*) The night was spent in a damp 'duree' On a similar night in another Rest-House (Khudrahi) a bear took shelter in the verandah For some unknown reason the bear started walking from end to end with his side rubbing against the wall and bumping on the doors (bolted from inside and reinforced with furniture) at regular intervals and kept me awake for part of the night The return journey was performed in frequent heavy rain and through swollen *nalas* The saheb had to do it only in wet khaki shorts



From Mandla, good fortune took me to the southern part of the Province to Chanda, another district, well-known for forests (teak) and big game The teak forests of Allapalli Sub-Division are quite famous A modern working plan had just then started functioning and it fell to my lot to supervise clear-felling in the first coupe of *P.B I* and to burn the slash to regenerate the area These forests had been under strict fire protection for several decades The Ranger was horrified at the idea of having to

* R N. Datta was a member of the Indian Forest Service, he served in Madhya Pradesh and retired as President, Forest Research Institute and Colleges.

set fire to the coupe and told me so I had, therefore, to start the fire myself Sowing of teak seed was done at the proper time as prescribed Some seedlings came up but most of them were smothered by bamboo regrowth. Soon it became clear that regeneration had failed in the coupes treated in this way Meanwhile, the technique of raising teak plantation was being studied and developed and the new technique of stump-planting was adopted in the later coupes to regenerate the entire annual area of *P B.I* Years later the earlier failed areas have had to be taken up again for regeneration one by one The above working plan has had two revisions already The experience gained indicated that in moist teak forest natural reproduction cannot be obtained to order within a short period and that it progresses slowly for many years provided the canopy conditions are periodically manipulated suitably Only areas having sufficient advance growth could be depended upon to regenerate naturally. The remaining area of *P B I.* must be planted up

As interesting interlude in Chanda was provided by the job of getting a forest track of 29 miles in Sironcha range into sufficiently good condition to enable the heavy car of a V I. P. to run on it Time allowed was fourteen days The area was then infested with man-eaters The existing track had very wide strips, locally known as 'tiger lines', clear-felled on both sides for the safety of those using the track Work was undertaken in fourteen sections simultaneously and in each section a member of the staff was assigned the duty of collecting the workers and escorting them, with loaded gun ready for emergency, to the nearest camp, one hour before sunset A fat Ranger was following one such group in a bullock cart one afternoon and a tiger was following the cart within a few yards of it For some reason or other the Ranger happened to look behind Instantaneously the gun went off. In the pandemonium the bullocks galloped away, cart and Ranger parted company in different directions, labourers scattered in confusion and ran and the tiger also disappeared

An excellent opportunity to study sal forests came my way in Bilaspur and Raipur districts as D F O. The eight years spent in these forests were very rewarding In both Divisions conversion of irregular forests to even-aged crops had commenced under modern working plans a few years earlier. The wonderful results obtained by Harlow after clear-felling a compartment having plenty of advance growth in South Raipur Division in 1924 or thereabouts had encouraged the Working Plans Branch to adopt the system As years passed, it was observed that *P.B I.* areas having little established reproduction or advance growth did not make much progress towards complete restocking and that regenerating such areas naturally within one prescribed period was not possible under the method applied merely by carrying out regeneration fellings periodically in *P B I.* The working plans had, therefore, to be modified in the light of this experience Only areas having sufficient advance growth could be regenerated successfully In the hill forests of Bilaspur frost hazard presented a complication which is practically absent in Raipur forests The necessity of retaining a frost shelterwood of sufficient density in the regenerated area for a sufficiently long period became apparent within a short time in Bilaspur

New ideas developed as a result of the experience of working the sal and teak forests under conversion for about three decades As regeneration of *P B I* frequently fell into arrears, the revisions of the working plans took this into account by modifying allotments to working circles, felling series and periodic blocks It has been suggested that during revisions when the stock-maps are also revised, all possible *P B. I* areas should be carefully assessed for established reproduction and in the case of teak forests, the annual planting capacity should also be determined The idea has been put forward that in sal forests the extent of *P B. I* should be limited to the area having advance growth which can be successfully regenerated during a period and the area of the working circle should be a multiple of the area of *P. B I* depending upon the conversion period and the number of periods The remaining sal forests should be allotted to a separate working circle for selection felling and improvement Teak can be very successfully regenerated artificially now Therefore, the planting capacity *plus* the area having advance growth should determine the extent of *P B. I* and the area of the working circle under conversion adjusted accordingly As in the case of sal, the balance of irregular teak high forests should be placed in a separate working circle for selection felling and improvement It remains to be seen how these ideas will actually work in practice

Forestry in Madhya Pradesh owes a deep debt to the aboriginal tribes inhabiting the remote areas As one progresses in one's career in the Forest Service, frequent contacts with them produces a desire to do something for their welfare. In Bilaspur, yaws was rampant among the

Bhumias A tour was arranged with the Civil Surgeon (Capt Richardson) and some patients were collected in a camp (Chhaparwa) for treating them experimentally and taking blood for culture and identification As soon as they saw the blood in the test tubes the whole lot stampeded With some difficulty they were prevented from scattering into the forest and were given the injections. Within a few days the long suffering patients improved appreciably and news came to headquarters that there was demand from many villages for treatment with the magic needle A touring doctor was placed on duty to go round the villages in due course

I recollect with some satisfaction the work of settling shifting cultivators of Raigarh and Surguja Districts A number of them had been sent to jail for unauthorised cutting of forests on steep hill-sides The Minister of Forests met them in jail and pardoned them on condition that they lived in villages established on lands to be allotted by the Forest Department Schemes were drawn up for rehabilitating these men and many others like them They were given land, timber for houses and everything else required for setting them up as cultivators free of charge by Government and cash grants to feed them until their crops were ready Thus started a work far-reaching in its effect on forest conservancy in remote areas and a new way of settled life for the aboriginals of the tract used to precarious living destructive to forests on hill-sides

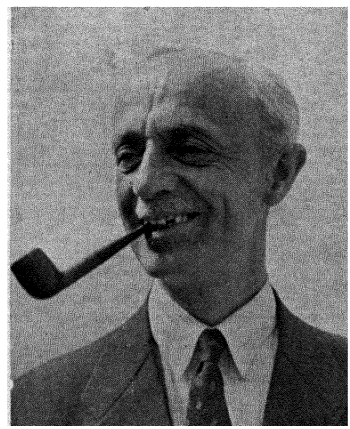
I carry most happy memories of the many officers and other members of the staff with whom work and recreation were always unmixed pleasure In the latter part of my career the keenness of my two little sons for touring in forests and the readiness of my wife to accompany us did much to brighten up the tours.

If I chose the Forest Service as my career over 35 years ago without knowing fully what hardships and pleasures were in store for me, with full knowledge of what I have had out of it, I would choose the same career again if this were possible

WATER, THE GREAT FERTILISER

(BY A P F HAMILTON)*

"What are now her mountains were lofty, soil-clad hills, her sandy pplains of the present day were once full of rich soil and her mountains were heavily forested—a fact of which there are still visible traces These mountains, which can now support nothing but bees, were clothed not so very long ago with fine trees producing timber for roofing the largest buildings, the roofs hewn from the timber are still in existence There were also many fine cultivated trees, while the country produced boundless pasture for cattle The annual supply of rainfall was not lost then, as it is at present, by being allowed to flow over the denuded surface into the sea, but was received by the country, in all its abundance, into her bosom where she stored it in her potter's earth, and so was able to discharge the drainage of the heights into the hollows and rivers with abundant volume and a country-wide distribution The shrines that survive to the present day on the sites of extinct water-supplies are evidence of the correctness of my hypothesis"

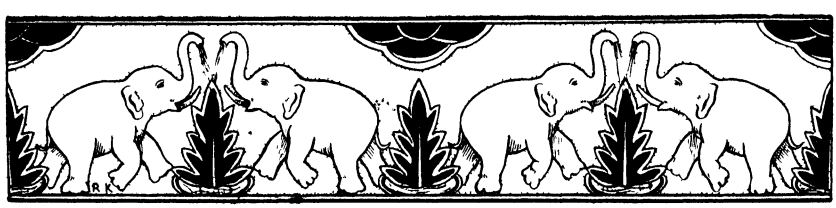


* A. P. F. Hamilton was a member of the Indian Forest Service and retired as the Inspector-General of Forests, Government of India.

What a graphic description? It might well be descriptive of conditions as they are to-day in a number of countries, it might with a few alterations, be a picture of the Shiwalik Hills in the Punjab not so very long ago But it is none of these things—it is a description of the ancient kingdom of Attica written by Plato some 2300 years ago So they had their conservation problems as long ago as that History does not record the cause of the disaster, it could have been the result of the "scorched earth" policy of some invader or of the slow but insidious misuse of the land or its natural covering Be that as it may, Plato was quick enough to associate desiccation and erosion with denudation of the hill sides, have modern civilisations always been so quick to understand? Or, having understood, have they acted? Had Plato been asked how the prosperity of the country side might be restored, he would, assuredly have replied, "first bring back the forest to hills and re-build the soil layer on the slopes, for prosperity depends on the guarantee of a permanent supply of water"

For water is a great, in fact, the greatest fertiliser Chemical fertilisers are all very well, but their application may be limited, because they cannot be taken up by plant as food unless a certain minimum of moisture is present in the soil In the passage of time it will be found that countries who have best conserved their water supplies will be able to maintain a higher degree of agricultural production than those who placed reliance more on the use of chemical fertilisers In a country where rainfall is inadequate or too uncertain to maintain a desired standard of living, water should be looked upon as a most valuable product of the soil, conserved and controlled, as far as possible, at all stages, to be used when most needed from storages such as reservoirs or, naturally, from wells, springs and the sub-soil

In India, as in many other countries, the demand for water is steadily increasing, and it will go on increasing as long as the internal economy of the country continues to expand Already in the U S. A, conservationists are making long-term forecasts of the water requirements of some regions of the country and the results tend to show that present supplies are likely to fall very short of what will be needed. It is true that in India the existing supplies available in the great rivers are not being fully utilised, but the time will surely come when they are, and unless effective steps are taken now to ensure improvement of supplies in the future, however distant that may be, such difficulties as have already arisen in the Punjab may be encountered Then there is the question of *permanency* This implies not only the assurance that the out-put of water for a given system will not decrease, but also that its availability for use may not be impaired For availability in the case of reservoirs depends on storage capacity, and the greater the silt load of a river the more rapidly is the storage capacity of the reservoirs it supplies reduced Engineers may claim that the effective life of a dam may be anything from 50 to 100 years, but what is that in the life of a rapidly developing country? No one has yet devised a means of clearing the millions of tons of silt which will accumulate behind a large dam, and the only course left is to take all possible steps to prevent silt being carried into reservoirs This means proper conservation measures in the catchment areas maintaining existing forest and vegetation at its maximum capacity by sound management and pasturage practice reforestation of denuded areas adoption of agricultural techniques which will conserve both soil and moisture These measures may often be difficult of application and expensive, but the difficulties must be faced, for the lasting prosperity of a great agricultural population depends mainly on the perpetual availability of a controlled water supply



LET US NOW PRAISE FAMOUS MEN

(BY C E HEWETSON)*

I have always been interested in the ecological approach to forestry and silviculture When listing the factors of the locality, a heading is usually given to the influence of Man This usually means the tendencey of the local population to start fires, to make illicit fellings, trespass or shoot without a licence One rarely takes into account the background and ideas of the Civil Administrators and Forest Officers who promulgate the Forest Laws and Policies Yet these ideas have shaped the structure of the forests over the last one hundred years more powerfully than any other single factor When one contrasts the history of forests in Germany and France with those of North America, it is easy to see what a very different course events would have taken in India if the first Forest Officers had been recruited from the United States and not from Germany

The factors which mould the thinking of Administrators and Forest Officers are primarily economic but sentiment and tradition also play their part in determining what Policy will be adopted The Forest Policy for India was laid down by the well known Resolution of 1894 It is interesting to recall what were the main points which the senior officers of those days emphasized When the Forest Department began its work its chief duties were the preservation and development of large timber forests Sir Dietrich Brandis saw very early that not only did the provision of timber and fuel to agriculturists come within the legitimate scope of the forest administration in India but also the increase in the supply of cattle fodder. The forests were considered mainly in relation to the local population in the Resolution of 1894, and the main concern was to see that only such lands were kept for timber production which could produce valuable timber In every paragraph the Government was at pains to advise that the interest of agriculturists was paramount

Paragraph 2 'This regulation and restriction (of rights) are justified only when the advantage to be gained by the public is great, and the cardinal principle to be observed is that the rights and privileges of individuals must be limited, otherwise than for their own benefit, only in such degree as is absolutely necessary to secure that advantage'

Paragraph 5 'Even in tracts of which the conditions are suited to the growth of large timber it should be carefully considered in each case whether it would not be better, both in the interests of the people and of the revenue, to work them with the object of supplying the requirements of the general, and in particular of the agricultural, population'

Paragraph 6 'It should also be remembered that, subject to certain conditions to be referred to presently, the claims of cultivation are stronger than the claims of forest preservation.'

'Certain conditions' referred to above were discussed in paragraph 7 and the most important was that 'cultivation must not be allowed so to extend as to encroach upon the minimum area of forest which is needed in order to supply the general forest needs of the country, or the reasonable forest requirements, present and prospective, of the neighbourhood in which it is situated In many tracts cultivation is practically impossible without the assistance of forests, and it must never be allowed to destroy that upon which its existence depends'

The Administrators of those days can be seen to be very sensitive to the rights of the individual and to have no desire to coerce the public, paragraph 11 says, 'The customs of generations alter slowly in India, and though much may and should be done to lead the people to their own profit, yet it must be done gently and gradually always remembering that their contentment is no less important an object than is their material advantage'

One may notice a very important omission from the resolution in that there is no mention of the private landowner and his forests In fact Government had no policy up to the time that most of the privately-owned forests had been destroyed England to-day provides an excellent example of how the attitude to forestry can be changed completely by providing incentives to private owners of woodlands Before 1920, forestry in England was kept alive by the enthusiasm of a small number of land owners, who loved trees and were fired by a sentiment which had

* C E Hewetson was a member of the Indian Forest Service

little economic backing, to produce some fine timber for posterity In the last 40 years the position has changed completely and now up and down the country there are scores of landowners who pride themselves on their woodlands large or small, and take great pains to learn all they can about the most recent techniques and use of new species The Royal Forestry Society has a membership of over 4,000 from England and Wales alone and there is an equally flourishing sister society in Scotland This change has been brought about by administrative and fiscal measures These have been devised to give incentives to forest owners Income Tax reliefs, Death duty concessions and grants for replanting and correct management have changed the whole attitude of the private owner Along with this the very friendly attitude of the Forest Service means that the conscientious owner can get good advice and sympathy in their efforts to develop their woodlands In this favourable climate a whole new profession of private forestry consultants and firms which specialise in carrying out forest works on contract have established themselves to help the smaller landowners who cannot maintain their own labour force or afford the special equipment for extraction of timber If only this attitude to the private owner had existed in India for the last 40 years what vast areas of private forest might have been saved from destruction and impoverishment

Turning from the general field of land use we may consider shortly some of the basic ideas which guided the early forest officers We may all agree that the conception of fire protection was one of the most creative and far-reaching in its effects Not only was it essential to allow the drier forests to regenerate but it was and is the most powerful single weapon in soil conservation It was a tragedy that this idea of complete fire protection was gradually 'eroded' away by the urge for economies in expenditure, from the earliest day the forest department was to be a revenue paying one Dr Voelker in his report said, 'The Forest Department is practically called upon to show a large revenue, and is naturally proud of the profit it makes' This pride in the annual surplus of a few lacs of rupees seems pathetic now when surpluses are counted in crores, and the main problem of the forest departments is to spend the money which is pressed upon them However in the last 100 years protection from fire has transformed many forests and though it is now impossible to get back to the ideal of complete protection, the conception is still working powerfully in the minds of all officers

Another important conception introduced by the close connection of Indian Forest Officers with Europe was that of the long rotation and building up the forest capital of growing stock In France and Germany this conception is still active and one sees forests kept extremely dense in many parts of Germany Whatever the present day forest economists are writing and teaching about the most profitable way to grow trees, this earlier conservative way of thought was undoubtedly of great value in India and produced conditions in which the growing stock was on the whole increased Considering the attitude of the Finance Department to expenditure and the concern of so many forest officers to financial results, any underlying concept less conservative would have made heavier fellings respectable and the shortage of large sized timber more pronounced than it is to-day

Another valuable heritage was the 'Working Plan' Yet in how many countries are Working Plans either not used or they contain no prescriptions for control of the yield? Particularly in countries where exploitation techniques have outrun silvicultural knowledge and where there was no tradition of sustained yield, the forests have been destroyed to feed large industries Quite apart from the advantages that spring to mind, one of the important side effects has been the discipline which the existence of a plan exerts on forest officers The preparation of each plan forces all ranks to think over the problems of each forest, and the revision of the plan draws attention to the results of the prescriptions and to what extent the objects of management have been attained

Perhaps only in the field of silviculture has the influence of European methods led to some mistakes The fault was not in the European systems but in the use of them in the tropics without realising that the silvicultural systems evolved in Europe to fit the requirements of the main timber species there, were not going to suit the tropical forests Though some magnificent young forests have been obtained by natural regeneration, on the whole it has not been found possible to obtain natural regeneration as and when prescribed in the working plan In most States, I think, it is true to say that the uniform system is being abandoned or is retained in name, but dropped in practice. In this field the European tradition has impeded pro-

gress towards evolving silvicultural systems suited to the conditions of tropical forests

I wish I had the scholarship to treat this historical approach to ecology with the fullness that it deserves, and I am only too conscious of the inadequacy of this short article, but if it turns anyone's thoughts to the great men who were the founders of the service to which we are all proud to have belonged, then it will have been not in vain.

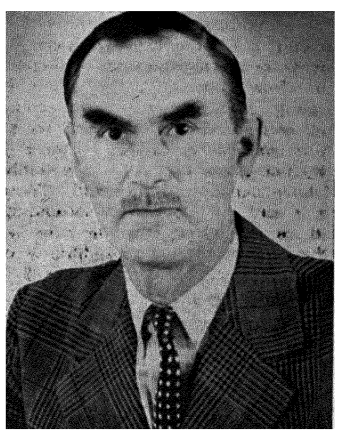
REMINISCENCES

(BY SIR HERBERT HOWARD)*

Fifty years ago men like Sir George Hart, Mercer, Sir Peter Clutterbuck, Hobart-Hampden, B B Osmaston, Caccia, to mention only a few, themselves remembered how the remote and semi-ruined jungles had been protected till they were full of healthy vigorous trees, how forest settlements had been made, reserves demarcated, roads laid out, bungalows and bridges built, fire-protection introduced and generally how order had been produced from chaos The first fifty years was mostly spent in such basic organisation

But, from the point of view of the newly-joined recruit trained in the forests of France and Germany, forest management was only in its very early stages In my own province, the United Provinces, there were plenty of Working Plans fifty years ago They were based on what was called the selection or selection-cum-improvement system but it was little more than a rough area control with a fairly high girth limit, with a long felling cycle of 30 years, plus improvement fellings There were no volume tables worth the name, no out-turn tables, certainly no yield tables, (a statement was made at one Board of Forestry meeting about 1919 that there could be no yield tables for another 20 years), no real start towards any conversion to uniform forest, no plantation work in the plains and nothing really worth the name in the hills, and, of course, such things as motor roads had never been heard of We toured with camels, carts or coolies and on our own flat feet or on horses

But the immense progress from the beginning of the Forest Department during the first fifty years up to 1910 or 1911, so evident to our seniors, was really continuous and the few years just before the first World War saw the beginnings of further great changes



In the United Provinces, J V Collier, made the first scientifically constructed volume table for sal about 1912 with me as his humble assistant, and started conversion of the irregular sal forest to regular high forest He also reduced the girth limit to 5 feet and the felling cycle to 15 years though, if I remember rightly, the eventual compromise was 5'-6" and 20 years I followed with the first conversion to regular high forest in what was then the Ramnagar Division next door

* Sir Herbert Howard was a member of the Indian Forest Service, he served in Uttar Pradesh and the Forest Research Institute, Dehra Dun and retired as the Inspector-General of Forests, Government of India

The first World War saw a good deal of activity in forest work The conversion from irregular selection to a more regular high forest rapidly spread to other forests both in the hills and the plains

Meanwhile, one or two adventurous spirits were trying to drive motor cars about the jungle I think the first regular motoring in the United Provinces was done by Oliphant in the North Kheri Division I was motoring in the Gorakhpur Division as far back as 1916 but it was a good many years before motor roads reached even to a Division like Dehra Dun It was not till about 1927 that any one managed to motor across the Western Circle from Tanakpur to Hardwar and, believe me, pretty rough going it was with chains to get through the mud and rolls of wire netting to put down on sandy bits and picked up behind you after driving over.

It was about this time that the notorious dacoit, Sultana, was making his home in the forests of the Haldwani and Ramnagar Divisions Doubtless many of the stories about him are apocryphal We often knew approximately where Sultana and his gang were hidden and we could have given him away to the police But we and our wives were completely alone in those jungles and, if we had given him away, we should very soon all have had our throats cut There was, therefore, a sort of tacit understanding that neither of us interfered with the other and we moved about in dacoit infested jungles entirely alone and with perfect safety

One of the neatest stories about him was when V A Herbert's camp clerk reported that Sultana's men had stolen his pony Herbert said that no doubt if he wrote a letter to Sultana it would reach him and the camp clerk replied that no doubt by some means or other it would reach him So Herbert wrote upbraiding Sultana that he had seen fit to molest anyone connected with the Forest Department So upset was Sultana about this that he sent back a note regretting the incident and returning the pony, the point of the story being that he returned the wrong pony

Another story about him was an occasion when the Ranger in full uniform arrived among the forest contractors, and said that that scoundrel Sultana was about, that he was the new Ranger and that the contractors had better hand over all their money to him for safe custody in the range safe This they did and Sultana, dressed in Ranger's uniform, disappeared with the loot. He had collared the Ranger in his Range quarters, tied him up, taken his uniform and brought off this somewhat neat dacoity When again complained to about this, he pointed out that he had not harmed the Ranger or any Forest Department official and had even returned the Ranger's uniform All he had done was to take money off the contractors

Do not waste too much sympathy on him He had a side to his character which was admirable and he did keep his word to Forest officials but it should not be forgotten that he was a cruel murderer and that he led people a dance for something like twenty years to my knowledge He was eventually caught and hanged

Meanwhile, during the same period just over fifty years ago, the Forest Research Institute started When I first remember it, the Forest College consisted of the old buildings south of the *maidan* in Dehra Dun and the President's office was in a little triangle of land just to the west of the College grounds Within the same building was the Utilization Division, consisting of one room if I remember rightly, with Sir Ralph Pearson in charge (though he had been preceded by Troup) and the other Research Officers were scattered about in various bungalows round the *maidan* and up the Rajpur Road

The first move into a properly constituted building, now the Doon School, was made about 1915 Kaunli Garden was the only experimental area and the move to the present magnificent site at New Forest only took place about 1925 Before that, the whole 1,100 acres area was bare cultivated fields

Silviculture had, naturally, always been of basic importance and the first Silvicultural Conference was convened in 1918

Another great improvement which took place during those years was the setting up of a proper Working Plans Circle in the United Provinces to take charge of all Working Plans in the province This was formed about 1919 and the first Working Plans Conservator was Trevor who had already achieved a great reputation with his working plan for the Kulu forests and for his natural regeneration work on spruce and silver fir

Incidentally by 1919, Trevor had actually obtained quite large areas of naturally regenerated spruce and silver fir and I saw no other areas of those species regenerated naturally by anyone except Trevor up to the time I left India in 1945 There was plenty of natural regeneration of

those species in the Chakrata Division and no particular difficulty in relying on natural regeneration but Trevor got it where he wanted it and when he wanted it and that was something that the rest of us could not do As Johnny Whitehead said to me when I was making the Working Plan of the Chakrata Forest Division about 1917 "the regeneration of spruce and the silver fir depends more on the will of the Almighty than on the efforts of the forest officer"

About 1920, silvicultural research began to be decentralised and in the United Provinces the first Provincial Silviculturist was appointed about 1919 From that stage onwards the Central Silviculturist, Dehra Dun, dealt specifically with yield tables, volume tables, out-turn tables and statistics generally, while, on the experimental silvicultural side, he dealt with the more general aspects of silviculture applicable to trees in general rather than with the detailed silviculture of particular species

Yield tables began to appear from Dehra Dun in 1924 (within five years of the meeting of the Board of Forestry where 20 years had been advanced as the earliest possible date to expect yield tables) and by about 1926, yield tables had been published from Dehra Dun for sal (*Shorea robusta*), sal coppice, *chir pine* (*Pinus longifolia*) deodar (*Cedrus deodara*), and blue pine (*Pinus excelsa*), while volume tables had appeared for *Acacia catechu, Bombax malabaricum, Cedrus deodara, Holoptelia integrifolia, Pinus excelsa, Pinus longifolia, Shorea robusta* and *Trewia nudiflora*, besides numerous other data on weights of seed, artificial regeneration and so on

Round about 1920, in Bengal, the *taungya* system of regeneration, which had been progressing for teak in Burma from spasmodic plantations to organised management, had reached the stage of organised management in Siliguri under Shebbeare Some of you may remember a photograph of Shebbeare careering about on a plough behind an elephant which, though possibly taken with somebody's tongue in somebody's cheek, intrigued a number of people on the advancements in Bengal

Almost immediately after Siliguri, in 1922, the first systematic *taungya* plantations, dealing with artificial regeneration of sal, were begun in the Gorakhpur Division of the United Provinces Despite early difficulties and set-backs they were eminently successful and, so far as I know, continue to be successful to this day

But artificial regeneration by the *taungya* system, or for that matter any other form of artificial regeneration, was one thing in the Eastern Circle with an all-the-year-round population and often land hunger, but was quite another matter in the fever stricken *bhabar* and *tarai* of the Western Circle where, except for the aboriginal *tharus* no one could live between about April and October and the whole population, except the unfortunate Forest Officer, migrated to the hills for approximately half the year Artificial regeneration in that area was quite another problem

A few plantations of miscellaneous species in the Haldwani Division had grown excellently for the first year but had been completely wiped out by deer in the second and third years

About 1927 a teak plantation of about 90 acres was started in Lakhmanmandi artificially and also plantations of *khair* and other miscellaneous species near Lalkua, all in the Haldwani Division These were all very successful and from then on plantations were continued on a larger scale certainly for some years Meanwhile, these successes led to extensions in other forest divisions of the Western Circle

The story of the first successful 90 acres of teak plantation in the *bhabar* of the Haldwani Division is worth remembering The idea was to plant the area with teak root and shoot cuttings and sufficient had been raised in the nursery to stock about 40 acres Orders were issued to fell 40 acres of forest but when the D F O returned from a distant part of the Division he found, to his horror, that about 90 acres of sal had been marked sold and felling started The difficulty of teak germination is well-known, so he thought at first of spreading plants for 40 acres over the whole 90 acres However, as it was essential to make a really successful plantation, he gave up this solution There was a small earth canal, little more than a trickle, at the top end of the plantation and he decided that it would be safe to fill the bottom end of the 40 acres with the root and shoot cuttings in June and, with the help of this irrigation, to sow the top 50 acres with teak seed early in April Germination was excellent but, unfortunately, the silt from the canal swamped the seedlings and it looked like certain failure Considering that success in this plantation was so essential to convince many doubters that successful plantations could be made even in this area, the problem was solved, believe it or not, by setting coolies on with buckets of water and rags to sponge the silt from the leaves of 50 acres of teak plantations What is more it cost very little and the whole 90 acres were eminently successful The teak must have been 45 to 50 feet high before I left India.

There were many adventures with these plantations They were game-proof fenced with here and there home-made ladders to get over the fence Unfortunately, a number of deer were enclosed inside the fence and the local tigers realised that here was a ready-made and easy meat supply They used to climb the ladders and feed on the deer inside

Some of the most interesting items on the introduction of artificial regeneration in these provinces occurred in the Dehra Dun and Saharanpur District I shall say no more about those because I have no doubt whatever that my old friend M D Chaturvedi will write them all up because he was directly responsible for much of the work Without his personality, the work would never have been accomplished I feel sure he will write something about it for this Centenary number and I only hope he writes it as amusingly as he told the whole story to me on tour in the two Divisions at the time it was happening

Things had been moving pretty fast from the time I went out nearly fifty years ago By the late twenties the United Provinces had a system of artificial regeneration for sal and other species which solved many problems in the Eastern Circle, motor roads to enable good and rapid inspection, a whole organised Working Plan Circle to revise plans at regular intervals based on better and better data and everything ready for a great advance during the last 25 years of the century The whole of the United Provinces was under good working plans by then, revised at regular intervals Unfortunately, soon after the beginning of this last 25 years, War broke out and the whole activities of the forest department were turned to supplying various articles of War These stories will, no doubt, be written by others

Having been in charge of the Working Plan Circle myself for many years, and therefore closely connected with possible yields, I prophesied repeatedly about 1943 that after a century of forest management in India, the real results of it should begin to show in yields and the United Provinces should show a very large increase in yield about 1960, despite the necessary overfelling during the War

I wonder whether that prophecy has been realised and I hope someone will be kind enough to write and tell me

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REMINISCENCES

(BY SIR LAWRENCE MASON)*

It is just fifty years since I first landed in India as an Assistant Conservator, so that my service dates from just half way through the centenary now being celebrated

My initiation into India was hardly a propitious one Although informed by the India Office that I was posted to the Central Provinces, on my reporting at Nagpur, I was told that there was no vacancy for me and nothing was known of my having been posted to the Province

A complete stranger in the land, I had no option but to return to Bombay and await instructions, feeling rather an unwanted person and somewhat deflated It was only after some ten days in an hotel and watching the departure of steamers for home with a strong feeling of nostalgia, that I received orders to report to the D F O, Hoshangabad The latter was in camp where I eventually found him It was not for many months that I was to see my first civil station I was fortunately fairly well equipped, although my D F O seemed surprised that I had brought no servant and no pony I spent the first three weeks with him in camp and mainly occupied myself in collecting a herbarium My only acquaintance with Indian trees was pickled specimens of leaves and fruits in the laboratories at Oxford Having secured a pony of sorts, an assortment of what proved to be very unreliable servants and a 'Shuldari' to sleep in, I was then sent off on my own to the Bori Forests below the Pachmarhi Hills

The main task allotted to me was to align and construct roads to open up the forests Not knowing a word of the language and with no one with me who knew a word of English and given a 'Ghat Tracer' for aligning the roads—an instrument I

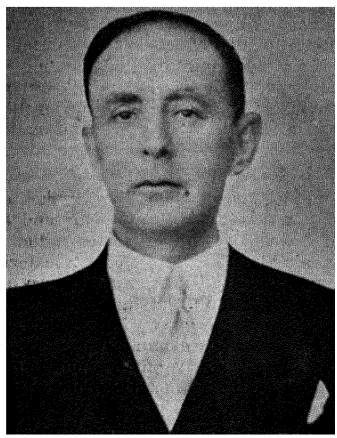
* Sir Lawrence Mason, C I E, O B E, was a member of the Indian Forest Service He served in Madhya Pradesh and Uttar Pradesh and retired as Inspector-General of Forests, Government of India.

had never seen before, I began to think that the life of a Forest Officer was not one for me

At the last halt before reaching my final destination, I was to have my first experience of 'big game' A number of excited villagers arrived at my camp and were evidently greatly upset Unfortunately, I could not understand what it was all about and I assumed that someone had been hurt or was dangerously ill Seizing my medicine chest, we set off together to their village This turned out to be some six miles away and it was beginning to get dark when I reached the village There I was shown the body of a woman, who had been killed by a panther I had brought with me a 475 H V rifle and a 12 bore D B shot gun I had a machan quickly erected and not realising that there would be no moon, I hopefully sat up a tree, thinking I might be able to shoot the panther Being my first experience of sitting up in the jungle, I must confess I became distinctly nervous as darkness came on After some time, I heard the panther below me and thinking I could make out the white on his chest, I could not resist having a shot with my rifle I heard the panther dash off through the dry teak leaves and realised what a stupid thing I had done in attempting to use a rifle when I couldn't see the sights, However, I couldn't get down from the tree without calling up the villagers and thereby endangering their lives I had, therefore, to sit on, getting in the meantime very cold as I was quite unprepared for such a contingency However, I had not to wait long before the panther was back again Being much calmer after my first effort, I took my shot gun with 'slug' cartridges and waited until I was certain I could make the panther out I then fired and felt sure I could not have missed him I heard him dash off but could hear he had not gone far My problem was then how to get down from the tree and to get back to my camp—six miles away Eventually, after an hour or so of waiting in the cold and hearing no movement of the panther, I became impatient, called up the villagers by a prearranged signal with a whistle and went off back to my camp Next morning we followed up the tracks and found the panther lying dead some 200 yards away From this experience I learnt lessons which I was not to forget for the rest of my service The villagers, of course, were delighted and from then on we were on the best of terms Their expressions of gratitude were most touching At first I had to carry on by the use of signs but one soon picked up enough everyday words to get along quite happily.

For food, I had largely to rely on my rifle and gun, green pigeon and pea-fowl being plentiful, while an occasional barking deer helped out For other supplies, I had to rely on the Army and Navy Stores in Bombay, the only shop I knew of in India.

In those days, of course, the only form of transport was the bullock cart and the journey to the nearest railhead took four to five days



Sir Lawrence Mason

One had to be the doctor to these simple people and each day one had a Sick Parade, some coming from quite distant villages One did one's best for them and was able to deal with minor complaints such as septic sores and so on and of course castor oil and epsom salts brought relief to many Quinine was also in great demand

Looking back over the years, one realises that perhaps it was a good training for the young Forest Officer—one simply had to learn the language, to become self-sufficient and to get used to living on one's own resources

With the interval of the monsoon months, as Personal Assistant to the Conservator at Jubbulpore, I returned to Hoshangabad District, being mainly engaged on the construction of forest roads It is perhaps of interest to record that my Conservator came to inspect the roads in a motor car, being one of the first motor cars to

be driven over forest roads. It caused tremendous excitement among the villagers and we had constantly to stop and open the bonnet to let the villagers see what was inside, making such a strange noise

On my posting to the C P, I was given to understand that I was going to a Province famous for shikar, but very backward in forestry It was certainly true that there was plenty of both big and small game, but as to its being backward in its forestry, there were compelling reasons why the forests were not under any regular system of management They were still recovering from the effects of past unregulated fellings, fires and uncontrolled grazing They were, therefore, fit only for silvicultural operations or what were termed improvement fellings So successful was this treatment that after a few more years they were brought under regular systems of management

I was on sick leave when War broke out in 1914 and it was not until after the end of the War that I was able to return to India Soon after my rejoining the C P, I was transferred to Dehra Dun as House Tutor, where I was placed in charge of the training of the students for the Provincial Forest Services The course, which included both theoretical and practical training, lasted two years, some twenty or more students joining each year from all the Provinces, including Burma

A high standard was obtained, comparable in every way with that at Oxford in my opinion Many of the students in due course obtained promotion to the then Imperial Forest Service One could not have asked for a better or happier lot of students and, to me, my time as House Tutor was a most rewarding one

From Dehra Dun, I was posted to the Andamans as Chief Forest Officer, an appointment generally looked upon as a 'Plum' In fact the six years I was to spend there were by far the toughest and hardest in the whole of my service Of the many problems we had to face, the most intractable were those of the regeneration of valuable mixed tropical forests and of the extraction of logs from them at an economic cost That both these problems have now been successfully solved, admittedly after many years of failure, constitute in my opinion, one of the outstanding achievements of Indian Forestry

After serving as a Conservator, first in the C P and then in the U P, I was transferred to Dehra Dun as I G F and President of the F R I Those were unfortunately days of retrenchment and the two posts were combined, with the result that justice could not be done to either It was, however, my good fortune to take part in the establishment of the Indian Forest College To begin with, much had to be improvised and the best use made of such accommodation as could be made available from existing buildings Fortunately, I was able to obtain the services of Mr E C Mobbs as head of the College and under his leadership, the College was soon successfully established It is very largely to him that the success of the College is due

The second World War brought my service as a Forest Officer to an end when I was transferred to the Department of Supply as Director of Timber Supplies

Times have changed greatly during the past fifty years, but it can be safely claimed that the reputation of the Indian Forest Service stands as high to-day as it ever did

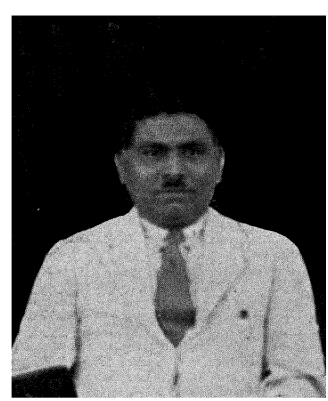
IN RETROSPECT

(BY J N SEN GUPTA)*

It is with much pleasure, and thanks, that I accept the kind invitation, which the President of the Forest Research Institute and Colleges, Dehra Dun, has been good enough to extend to the *retired* gazetted forest officers (besides the serving ones) for contributing articles of interest to the proposed Centenary Publications on Indian Forestry, in 1961 Personal reminiscences being more on the subjective than on the objective side, may have a tendency to the frequent use of the 'first person singular' in an article on retrospection, for which one must apologise at the very outset

On completion of my training for the then Provincial services at the Forest Research Institute, Dehra Dun, I joined the Forest Department of Bengal early in 1923, and retired from the State of West Bengal early in 1954, after a continuous service of 31 years, of which 5 years were spent at the F R I, New Forest (Dehra Dun) on deputation to the Government of India The best part of my life was devoted to the service of Forestry, in general, and to the branch of Silviculture, in particular When we arrived at Chandbagh, the then site of the F R I, Dehra Dun, on the 'All Fools' Day', 1921, the atmosphere was already surcharged with a reign of terror amongst our seniors, whose suspense on the eve of an impending decision for the retention of some and removal of others, naturally unnerved us considerably Luckily for them, as well as for us, this object of terror was soon succeeded by a more pleasant tactful and sympathetic Instructor in the person of Mr L Mason (later known as Sir Lawrence Mason, Inspector-General of Forests), who managed to give a new orientation to our future outlook The moral of this is that the officer-in-charge of a training course can make or mar the prospects of recruits for any service, however, sound their mettle may otherwise be in the opinion of the recruiting personnel The few excellent Principal-cum-Instructors I came in closer touch with in later years at Dehra Dun were Messrs Hall, Mobbs and Ranganathan, whose names should be written in 'letters of gold' in the history of Indian Forest Colleges

The writer had no regrets for having joined the forest service, as it afforded him the best possible opportunities for developing himself in a calm and charming atmosphere, mostly in communion with nature, unruffled by the growing sophistication of a more civilized life outside the forest Walking miles after miles over rugged hills and dales wading through knee to breast-deep waters, cycling or riding on ponies along narrow roads or bridle paths, and later motoring on better and wider roads over the plains and hills, with occasional rides on elephants through the forests or, while in river districts, moving about in steam or motor launches, rewarded at times by hunting and shooting wild game, and, above all, the exceptional camp life either in tents or in rest houses, etc, had a peculiar fascination of their own Forest life had its risks with occasional mischances overtaking us to be forgotten and laughed out overnight Eerie experience of having encountered wild elephants, perambulating solitarily or in herds in the Bengal Duars and Chittagong Hill Tracks, is still vivid in my memory In the virgin forests of the latter on the borders of Burma, I had once to sleep in an improvised resting hut erected in 3 hours, all with bamboos and wild banana leaves (December, 1926), with a loaded rifle by my side in self-defence, and to scare away roaming elephants and bison in particular If with better roads, easier motor transport and more conveniently placed rest houses, etc, have made touring and camp life more easy and comfortable now than



* J. N. Sen Gupta was a member of the West Bengal Senior Forest Service. He worked in Bengal and the Forest Research Institute, Dehra Dun.

they were in our time, with the result that the present generation of forest officers may not have to encounter such hazards now-a-days, it is no reflection on them, nor, do I envy them My only regret is that they know not what they are missing!

My long and eventful career can be split up into three periods, each having some bearing on the progressive development of forestry in India Firstly, I worked for 12 years in the best sal forests of the Bengal *duars* and *terai* on the sub-Himalayan zone, first in compiling the working plans of two major Divisions, Buxa and Jalpaiguri, for 4 years and then as their D F O for 8 years (with short acting periods of Conservatorship in that circle) Secondly, with 5 years as Assistant Silviculturist in the tropical evergreen forests of South Bengal and another 5 years as Experimental Assistant Silviculturist at the F R I (on deputation) and finally 4 years as the State Silviculturist in West Bengal I could legitimately claim to have devoted (with, perhaps, the only other exception in Mr M S Raghavan of Madras and Andhra) the maximum number of years (14 years) to Indian Silviculture Lastly, the remaining 5 years of my service were on various special duties, including one year in charge of the Bengal Forest School

The above periodic duties have left some indelible impressions in my mind, that may be recorded here for what they are worth to comrades of my younger generation In our time, practically all working plans used to be scrutinised and approved by the Inspector-General of Forests —a wholesome practice that has long been discontinued (since about 1940) Excess fellings during the last War and post-War planning operations soon after were responsible for lack of any effective control over these plans As an outstanding example, the volume control exercised on annual fellings in the past, especially in some of the sal divisions, has been replaced by the dubious area control, irrespective of volume-fluctuations caused by severe occasional fire, cyclone, or very poorly stocked clear-felling coupes The area-control system sets at nought the fundamental principle of a 'sustained annual yield', which forms the basis of forest management, and is, therefore, a retrograde step after the volume-control maintained in the past I am of the opinion that the I G F 's control over working plans must be restored If he has not the time for it, provision should be made for creating the post of a D I G of Forests, to which a very senior officer who has specialised in working plans, in particular, should be appointed Without an effective check on working plans, the implementation of the National Forest Policy of India is out of the question

Intensive activities and developments in Indian forestry took place in the twenties and thirties of the present century, when the cadres of gazetted services, depleted during the first War, were filled up in quick succession with fresh recruits In Bengal, the *taungya* cultivation, as a method of artificial regeneration, was given a new fillip under the able leadership of Mr E O Shebbeare, who was the head of the Forest Directorate for more than 12 years His energy and optimism proved contagious to all his colleagues, with the result that excellent plantations, certified to be the best in India, of sal, teak, *champ*, and a number of other important species sprang up, almost simultaneously, in most divisions

Silvicultural research was also properly organised in most of the States during this period What with greater concentration on utilization activities during the last World War, post-War planning, reorganisation of States on the attainment of Independence, depletion of requisite personnel, etc, silvicultural work was held in suspended animation for about 10 years (1941—50) both at the F R I as well as in the States A great deal depends on the personality and efficiency of the Central Silviculturist at the F R I, so that the tradition built by the late Mr Troup, Sir Herbert Howard, Sir Harry Champion, and a few others of lesser eminence, may stimulate the present generation of Silviculturists

The partition of Bengal in 1947 deprived us of about two-thirds of our forest areas—including the *gurjan* and other Tropical Evergreen forests, the excellent plantations of teak and other species, and the mangrove forests of the Sunderbans in the estuaries of the Bay of Bengal. To us, who had developed the natural and artificial regeneration of these forests, this dismemberment was a major disaster

I have a great regard for New Forest, where I spent some of my best years and worked with a few stalwarts in Indian Forestry, whom I had the opportunity of meeting again even after my retirement both at the Fourth World Forestry Congress (1954) and on the occasion of the Golden Jubilee of the F R I. (1956)

THE UTTAR PRADESH FORESTS 50 YEARS AGO

(BY E A SMYTHIES)*

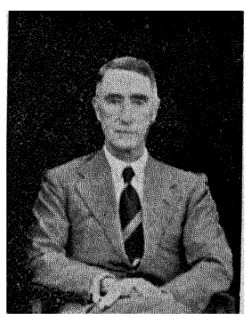
There have been amazing developments in the U.P. forests, especially during the past dozen years, to which Shri M D Chaturvedi contributed so much, and it may be of interest to recall the small and comparatively primitive conditions which existed half a century ago, from which these great developments later evolved I joined the U P Forest Department in 1908, and so can describe at first hand those early conditions

Let us look first at the over-all picture There were only two Circles—Eastern and Western, totalling about 4,000 sq miles—compared to the six (or is it seven?) Circles at the present time, which cover over 13,000 sq miles The administration was still very much under the control of Simla, a relic of the times of Brandis, Schlich and Ribbentrop and all senior appointments, working plans, and proposals for major developments had to go to the Government of India for sanction Conservators were shunted from one Province to another by seniority, regardless of the fact that in their new posts they were usually quite ignorant of local conditions, silviculture, and even language

The tempo of life and touring was leisurely Motor cars and motor roads were, of course, not even dreamed of Even the journey from Kathgodam to Naini Tal involved 12 miles by two-horse-tonga, followed by a 2000' rise by pony or *dandy* The D F O started his touring in October, or in malarious areas in November, and would usually not see his head office again before June In the Plains Divisions, he rode an elephant or a horse and his camp was moved by camels or carts In the two hill Divisions, Naini Tal and Chakrata, the camping depended on "Begar", a compulsory drain on local villagers to supply coolies to carry everything on their heads or backs from one camp to the next, a system which was as unpopular as it was inefficient

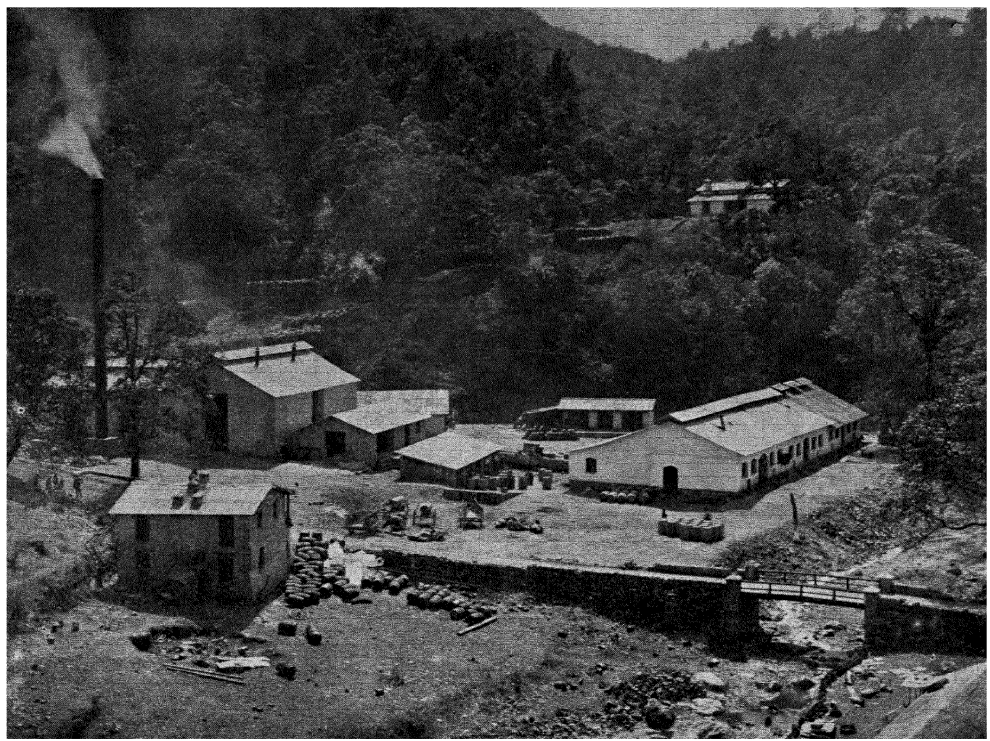
Let us now consider the different forest zones, starting with Kumaon Except for patches of forest near the three stations of Naini Tal, Ranikhet and Almora, which had been originally reserved primarily to supply those stations with timber, firewood, charcoal etc, the extensive forests of Kumaon and Garhwal were under the Civil Authorities, without regular working plans or regular management, more or less on a caretaker basis, the principal object being to meet and ensure the forest requirements of the local villagers

The resin industry, which has developed into such a dominant factor in the economy of the U P Himalayan forests, was in its infancy Resin tapping was practically confined to the fire-protected chir forests around Naini Tal and Ranikhet, and was under the control of the D F O,



Naini Tal In 1909, the year before I was put in charge, the nett revenue had dropped to Rs 8,600 and there was some talk of scrapping the business altogether The distillery was a very primitive business at Bhowali, with two or three large copper stills heated by open fires, involving a tremendous fire-risk The turpentine and rosin produced were both inferior in quality and difficult to sell A long series of experiments, carried out with the advice and help of the young Forest Research Institute Dehra Dun, finally proved that both products could be improved to first grade quality by steam distillation and redistillation, so the Forest Research Institute was a vital factor in saving an industry which now produces 3,00,000 maunds resin annually, Rs 50 lakhs gross revenue, and distributes Rs 20 lakhs per annum amongst the hill villages of Kumaon and Tehri It was some years later that the Rosin and Turpentine Co was started, and the distillery transferred to Clutterbuckgunj I

* E A Smythies, C I E, was a member of the Indian Forest Service he worked in Uttar Pradesh and the Forest Research Institute, Dehra Dun and retired as Chief Conservator of Forests Uttar Pradesh



Bhowali Distillery, 1912 Photo E. A. Smythies.

remembei an occasion when my old friend Pandit Pant successfully defended the Forest Department, in the important legal case brought by the I T & R Company, in order that Kumaon should not suffer.

The Eastern and Western Circles These include the great sal belt that runs from one end of the Province to the other. Half a century ago the problem of natural sal regeneration, which has since exercised so many forest officers for so long, had not even arisen, the successful introduction of fire protection 30 and 40 years earlier had stimulated extensive areas of established reproduction (as seen in the forests of Nepal today) to develop into well stocked young pole crops, which were not ready for regeneration, and the activities of the Department were predominantly utilisation of the overwood, for sleepers and the building trade, and fire-protection

The demand for miscellaneous species was very small The finest *khair* trees, 3½ to 6 feet girth, sold for Rs 3 per tree Until the F R I had carried out their experiments with match timbers and bobbins there was little demand for *semul* or haldu and other species The regeneration of these species was completely ignored, and the present day extensive plantations, by *taungya* and other means, were not even a dream A great belt of these miscellaneous forests, in the *terai* south of Lalkua, has now been converted into miles of sugarcane, but the *taungya* and other plantations elsewhere ensure an ever increasing yield.

The Land Management Circle, which now covers more than 1,000 sq miles, did not exist, but the first faint glimmer of possible future developments in this (now) important branch of forest activity had recently appeared, with Sir John Hewett's resolution (inspired by Sir Peter Clutterbuck) that "The Forests are called to come down from the Hills", and start afforestation so urgently needed in the Plains A decade later, a number of experimental ravine plantations had been taken up, which were utilised in Famine Relief works in the 1919 Famine, probably the first and the last time that the Uttar Pradesh Forest Department was called on to administer the Famine Code on a fairly extensive scale. The latest Annual Report figures available indicate that there are still very extensive areas of "Unclassed" forests to be tackled, that this work is continuing, and that the faint glimmer of a dream started half a century ago will soon be a light shining over most parts of the Province

The preservation of Wild Life, which started in the Eastern and Western Circles with the control of poaching in the 1870's by the early years of this century, had proved astonishingly successful, so that the forests were supporting an excessive stock of *chital*, *gond*, and other deer (except when thinned out periodically by rinderpest), and as a natural and inevitable result, a great increase in tiger and other carnivora The U P forests in this respect provided a striking contrast to the adjoining forest of Nepal, in which I toured extensively later, and never failed to be impressed with the comparative paucity of wild life, except in the Chitawan rhino sanctuary, where some attempt to protect the wild life was made Fifty years ago the creation of game and bird sanctuaries, like the modern extensive National Parks and Sanctuaries, was never contemplated

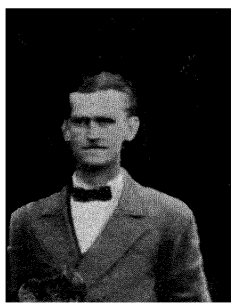
Man-eaters in Kumaon were however prevalent, and I shot my first tiger in 1912 by the light of a lantern, over half the body of an unfortunate *bania*, who had been seized from a little shop on the main road between Bhowali and Khairna, and earned Rs 500 reward It was about this time that Jim Corbett started his long-sustained war against the man-eaters of Kumaon, acting on occasion as his own bait For instance, where a tiger was known to follow gangs of grass-cutting hill women and seize one that loitered behind, Corbett would dress up as a woman and loiter behind And that required some nerve

In this brief article I have attempted to give a picture of conditions as I remember them 50 years ago, and to indicate the humble origins of some of the spectacular developments, which stand to the credit of the Uttar Pradesh Forest Department in recent years

MY MEMORIES OF THE FORESTS OF INDIA

(BY C C WILSON)*

The forests of India are one of its greatest assets They are richer in timbers of high quality than are those of almost any other country Teak, perhaps the greatest timber in the world, is indigenous to the country, as also are Deoar, Rosewood, Sal, *Sisham, Ainee, Irumbogam* and many more



Apart from timber the forests produce a variety of useful and necessary commodities which yield a handsome annual net revenue

But of even greater importance than the timber or the fuel or the minor products is the influence the forests have on the climate and the soil of the country

Scientific forest management started in 1861, just 100 years ago when the frightening shrinkage in the forest cover was first appreciated Among the names of the pioneers of forest management in India that spring to our mind those of Brandis, Schlich, Gamble, Troup and Richmond are outstanding

There was an uphill task As it has been in all countries in its incipient stages, forest conservation was unpopular And this is easy to understand as the dwellers in the countless villages all over the country had, from time immemorial, obtained a great part of their daily needs from the jungles First and foremost was the question of fuel with which to cook their food Without that they could not live Then there were small timbers for building without which they would have no shelter, ploughs without which they could not cultivate the ground, grazing without which their cattle would die, green-leaf manure for their fields, tanning bark for their leather, bamboos for a dozen different purposes And these were vital to their well being, and always they had taken them where they could find them And then an authority come into being which denied them what they had always looked upon as their rights They fought most bitterly and, indeed understandably, against the new tyranny They had neither the education nor the intelligence to realise that their little village forests were fast disappearing and that, if the process continued, the country would become uninhabitable

The villager did not understand that he was not being denied these essentials but that their extraction was being controlled and limited to the amount of each year's increment But even so the control spelled hardship, though far less hardship than would have resulted if unlimited use had been allowed, as it had been in the past, for so the village forests would eventually have ceased to exist

Indeed it was not only the villager that did not understand At the end of my service when I was Chief Conservator of Forests in Madras, a very great man, Mr Rajagopalacharya, was the Premier He sent for me and told me that his advisers were pressing him to abolish the Forest Department as being oppressive, expensive and useless

I explained the position to him and urged on him the advisability of reframing from drastic action till he had time to see for himself the working of the department and the results we had achieved in some of the forest reserves Within six months he was preaching Forest Conservation wherever he went.

I served in the Indian Forest Service for 32 years and by the end of that time I saw a great change in the outlook of the villager He realised that what was being done was solely for his good, he saw that his forests were no longer receding but were, indeed, increasing in productivity, and though he still took illicit toll of the produce when he could do so with impunity, he had ceased to look upon the forest department as his enemy

That was more than 20 years ago Now from what my friends in India tell me the preservation

* C C Wilson was a member of the Indian Forest Service, he served in Madras and retired as Chief Conservator of Forests.

and improvement of the village forests is recognised as being of paramount importance, and the extension of the big timber plantations is persevered with wherever the climate and soil are suitable as they make a valuable financial return, at the same time supplying the trade with all the high class timbers it requires

India is particularly fortunate in possessing such a variety of magnificient timbers growing naturally in the forests In addition she has many lakhs of rupees worth of minor forest products that are extracted every year

One of the most valuable of these is lac The insect which produces it is introduced by villagers into certain species which serve as suitable hosts Here it grows and multiplies and forms the encrustation that yields the lac of commerce

Another is sandalwood, *Santalum album,* that is found only in the forests of South India and nowhere else in the World This wood is so valuable that it is sold by the pound instead of by the ton And at one time it appeared that it was being killed out by the "spike" disease Some of the most useful work on this was done by Ranger Rangaswamy Iyengar He erected cages over selected sandal trees, each with a wire mesh of different gauge so as to exclude insects of varying sizes that were suspected of being vactors From these experiments considerable knowledge was gained though, at the time I left India, no cure for the disease had yet been found

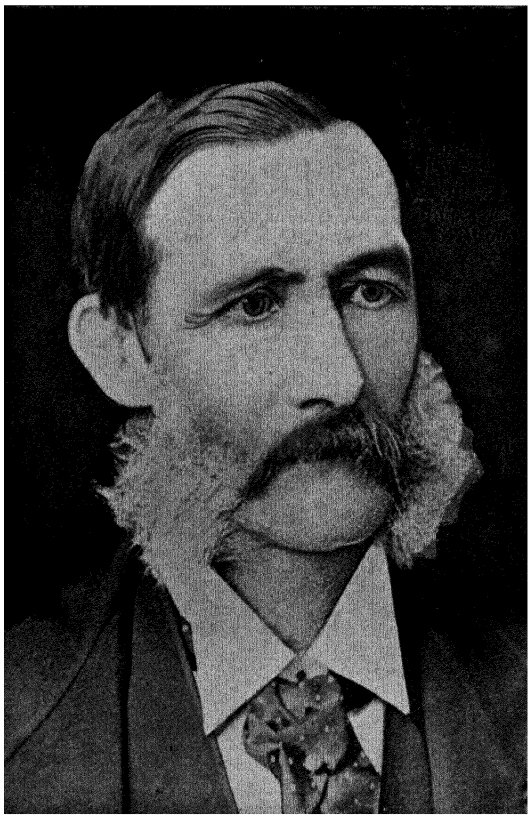
One of the most important contributions to the success of forestry in India has been the intensive research undertaken at the Forest Research Institute at Dehra Dun With tireless industry, the experts there have attacked the numerous problems that are continually arising and always must arise, in connection with the vast industries that depend on the produce of the forests

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Great trees are long in growing,
but they are rooted up in a single hour

—Curlius, from Latin





BRANDIS

Sir Dietrich Brandis, Ph.D., L.L.D, F R S, K.C. I E, was born at Bonn on 1st April, 1824, son of Dr Christian Brandis, Professor of Philosophy in the University of Bonn He was educated at the Universities of Copenhagen Gottingen and Benn. In 1849 he filled the post of a Lecturer in Botany at Bonn It was as a Botanist that his attention was drawn to questions connected with the management of forests.

In 1856, he was selected by Lord Dalhousie, the then Governor-General of India, to take charge of the teak forests of Pegu in Burma. He landed in India in 1856, and a year later the entire forests of Burma were placed under his charge. His herbarium and botanical library which he shipped from Calcutta to Rangoon were lost as the boat which carried them capsized He looked upon this almost as a divine directive to his future course of work While he never quite abandoned botanical studies, thereafter he devoted most of his energies to mastering the science and practice of Forestry

Prior to 1856, there was no organised attempt to extend and develop the forests or to protect them Brandis organised a scheme for the management of the forests of Burma, in the teeth of fierce opposition from the timber contractors who argued that the supply of teak timber in the forests was inexhaustible and State interference was unnecessary He introduced for the first time the method of what he called 'linear valuation surveys' and framed, on the data obtained, what was virtually the first working plan, with an estimate of the growing stock and a calculation of the annual sustained yield He thus saved the forests of Burma, which today constitute one of the chief sources of supply of teak timber to the world

In 1862, he was invited to advise Government on forest matters, and in 1864, he was appointed the first Inspector-General of Forests to the Government of India He inaugurated the management of forests on scientific lines A Forest Department was created, and a forest law enacted which provided for the settlement, demarcation, protection and management of forests. To him and to his successors, Schlich and Ribbentrop, is due primarily the credit for the creation and organisation of the Forest Department, and for the introduction of methods of management, adapted from the best European schools, to suit the diverse conditions of Indian forests.

In 1866, he initiated the system of training recruits in continental forest schools, partly in France and partly in Germany Under this system, which lasted till 1886, a number of distinguished forest officers were recruited to the Indian Service

Brandis was created a Companion of the Indian Empire in 1878 He practically relinquished the post of Inspector-General of Forests in India in 1881, when he proceeded on special duty to Madras He finally retired in 1883. On that occasion the Government of India acknowledged his services in most eulogistic terms, granting him not only a special pension but a substantial gratuity in recognition of his meritorious services He was awarded a Knight Commandership in 1887 for his services in India

The connection of Sir Dietrich with the world of forestry continued even after his retirement. For eight years (1888-1896) he superintended the practical education in forestry of students at Coopers' Hill From 1896 onwards he was engaged in writing his monumental work, "Indian Trees", which was published only a few months before his death in 1907

During his association with Coopers' Hill and also afterwards, he guided the studies of a number of young Americans, who later organised the Forest Department of the United States His influence in this respect had been so great that President Roosevelt, in 1896, sent his photograph to him with the following inscription *"To Sir Dietrich Brandis, in high appreciation of his services to forestry in the United States. From Theodore Roosevelt"*

Brandis was not only a great administrator, but also a scientist of high order During his career in India he wrote an endless number of reports and papers, and in 1872-74 he interrupted his forest work by writing "The Forest Flora of North-West and Central India", a work so highly thought of that he was elected a Fellow of the Royal Society in 1875.

His valuable contribution to the field of Indian forest botany is commemorated, by his colleagues, who named several plants after him These include, among a host of others,

Calamus brandisii Becc,

Beilschmiedia brandisii Hk f.,

Dendrocalamus brandisii Kz.,

Diospyros brandisiana Kz,

Ochlandra brandisii Gamble,

Macaranga brandisii King,

Millettia brandisiana Kz,

Orophea brandisii Hk f & Th,

Pedicularis brandisii Benth,

Quercus brandisiana Kz,

Ardisia brandisiana Kz,

Iodes brandisii Kz

Ixora brandisiana Kz

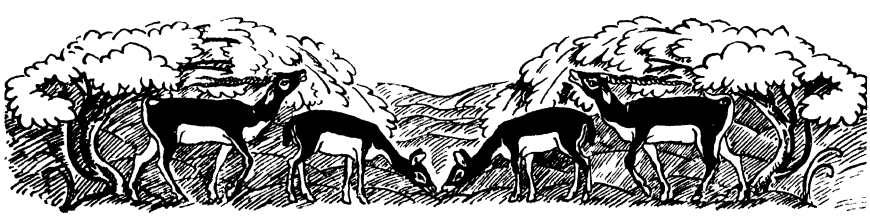
Loranthus brandisanus Kz,

The genus *Brandisia* Hk f. & Th. is also named after him

Brandis was a Fellow of the Royal Society, the Linnean Society and the Society of American Foresters He was a Doctor of Laws of the University of Edinburgh, and member of several other learned societies

What, may be asked, were the personal qualities of the man who was able, in the face of opposition now hardly conceivable, to carry out the work which he had set himself to do The answer is, intense enthusiasm and immense physical endurance coupled with professional integrity and an insatiable thirst for knowledge He convinced his superior officers and stimulated his subordinates

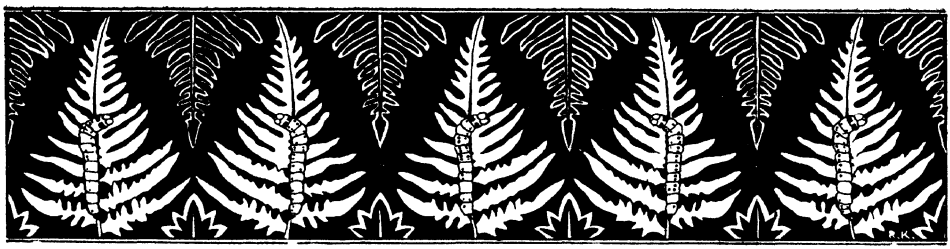
Brandis was truly the founder of Indian Forestry On the occasion of the Centenary of Forestry in India, we foresters salute him and pay our respectful homage.





THE FORESTS OF INDIA





Where man lived the longest in organised societies there the land is in worst condition This is true of farm land, grass lands and forest lands, though forest lands seem to be the first to be demaged and misused

—Lowdermilk



FORESTS OF INDIA

CHAPTER I

HISTORY

Introduction

As with any other nation, the history of the forests of India is linked with its political history and its demographic pressure Political changes have led to new developments in the administration of forests as well The two World Wars made enormous demands on forests and affected the progress of forestry on scientific lines. Even apart from the adverse effects of wars or political changes, with the passage of time the primeval forest has had to give place to well-managed forest estates or organised plantations. The demographic pressure, which has increased almost in geometric proportions, has made insidious inroads into forests The vast land with its varied climatic and geological conditions, its different types of forests and its enormous population with its ever-increasing demands on the forests have all contributed to make the history of India's Forestry complicated and at the same time interesting Nowhere in the East has forestry developed so rapidly and to such a degree as in India from almost the primitive under-exploited stages, through uncontrolled and excessive working, especially of accessible areas, to systematic and organised management on scientific lines under technically qualified personnel A century of forest traditions lies behind India's Forestry of to-day The achievements of the Forest Services of India during the last century have led to India gaining a leading place in tropical silviculture, in forest conservation and in forest management It must be mentioned, however, that in the fields of forest exploitation and utilization progress has not been so marked, particularly because of the economic feature of a large population always in need of spare time employment

Very little is known of the features of forest administration in the country prior to the initiation of regular forest operations by the British on their attainment of the supremacy in India. Forestry in the British period up to 1925, is exhaustively covered in the valuable book, "The Forests of India" by E P. Stebbing which gives a general account of the early history of India's forests besides a detailed account of the progress of Indian Forestry from a hundred years ago There are also two other earlier sources of information, viz, Ribbentrop's "Forestry in British India" (1900) and Cleghorn's "Forests and Gardens of South India" A detailed account of the subsequent period since 1925 is yet to be brought out The progress of forestry in India has, however, been very rapid during the last 40 years and it is hoped that a minimum of information regarding this period will be included in this Centenary Publication.

In the very early stages when the population was comparatively small, the demands made on the forests or the manner in which they were exploited did not seriously affect the general well-being of the forests But as population pressure increased and cultivation spread in an increasing measure, the forests began to be affected very adversely The land abandoned after shifting cultivation reverted to forest growth, but always of a very inferior type and even that only in areas where the factors of the locality were wholly favourable In all other areas, where the rainfall was not heavy and the soil not rich, rehabilitation of the area into useful forest became a real problem, especially with the adverse factor of grazing coming increasingly to bear upon these sites

Forests in Ancient India

In the pre-British periods, the successive waves of invasion and immigration into India inevitably had their effect on the forests Even as long ago as 2000 B C there is evidence of a flourishing Dravidian civilisation but it would appear to have been in consonance with the forests that were then in such abundance The early Aryans were a pastoral people, interested in the pursuant of agriculture, they cleared forests only in the areas in which they actually settled down and maintained all their big institutions in the sylvan surroundings of the forest The Mahabharata and the Ramayana give attractive descriptions of forests like *Dandakaranya*,

Nandavan and *Khandavavan* The ancient culture of Hindus had its origin in the *Aranyas* and *Ashrams* Even the concept of wild life conservation finds support in the maxim "*Ahimsa Paramo Dharmaha*" There was great reverence for *Vans* (forests) and groves near temples, even if there was no effort on the part of the rulers or the peoples of the land towards any regular management of forests for their perpetuation However, the records of Chinese pilgrims (600 B C) refer to dense Indian forests Again, even in the north-west region, records relating to Alexander's invasion (327 B C) mention dense forests But the various parts of India were under different local rulers and there was no organized government over any considerable tract until the reign of Chandra Gupta Maurya (300 B C) In his days, there was a Superintendent of Forests, who was assisted by some staff The protection of wild life in the forest areas was part of their duty There were punishments for forest offences The punishment for unauthorised killing of elephants was death The forests of those days, under Hindu rulers, were classified as—(i) those set apart for the study of religion, (ii) reserved forests for the supply of forest produce, (iii) forests set apart for the grazing of the royal elephants, (iv) hunting ground of the Royalty and (v) hunting grounds for the public During the days of Ashoka, much importance was laid to the planting of trees along the roads and on camping sites Growing of medicinal plants was also encouraged

Forests in the Muslim Period

With the Muslim invasion, the local people who were uprooted sought refuge in the forests which they cleared for settling down The invaders did not have any special interest in the conservation of forests either, they cleared them either for strategic reasons or even for other purposes They were, however, interested in forests for hunting and in the creation and maintenance of gardens besides planting of trees along the highways and canals The great Moghul Emperor, Akbar, who evinced interest in the planting of trees along canals, directed "that on both sides of the canal down to Hissar, trees of every description, both for shade and blossom, be planted, so as to make it like the canal under the tree in Paradise" With the fall of Moghul Empire, the country was divided into a number of small kingdoms that were frequently fighting among themselves, as a result of which many people abandoned cultivation in disturbed areas and resorted to remote forest areas The increase in population also led to the clearance of more forest areas for agriculture Shifting cultivation in the hills was also responsible for clearance of forest lands more than necessary There was no organised interest in forest maintenance Only specified species of timber value were proclaimed by local rulers as "Royal trees" and royalty was collected for the extraction of such trees Otherwise, the forests were open to all and the public obtained their requirements without restriction

Forests in early British Period

In the early years of their rule, the British also made large indents on the timber wealth of the country The newly established British Administration in India was not alive to the need for careful husbanding of forest resources and was even under the impression that the forest wealth of India was inexhaustible The British themselves were new to ideas of systematic forestry, as they had no developed forest organization then in Britain As supplies of first class oak timber became short in England, large quantities of teak from India were used for the British Admiralty's fleet

At the close of the 18th century the position regarding forests in India was no better than before the advent of the British Only certain species which were acceptable for export purposes were exploited and that also in an unregulated manner Apart from timber, the sandalwood of South India was exploited for its highly scented wood and it found its way to different European markets In fact, all the requirements needed for Governmental activities were then easily procurable from the forests The people also obtained all their requirements without difficulty Naturally, the state of affairs could hardly be conducive to forest conservancy On the other hand, in many localities forests were considered an obstruction for further development of agriculture Hence, no serious attempt was made to prevent destruction of forests The general policy was to expand agriculture and to obtain teak and other timber for the Navy and for constructional purposes But even in the early decades of the nineteenth century, the rapid diminution of forests and their likely failure to continue to yield the requirements (especially of selected species) in adequate quantities began to be felt by the administration.

First Steps towards Forest Conservancy

The first step in Indian forestry began in the South In the year 1800, a Commission was appointed to enquire into the availability of teak in the Malabar forests Regulations followed prohibiting the felling of teak below 21 inches in

girth In 1805, a Forest Committee was constituted to enquire into the capacity of forests and the status of proprietary rights in them The Committee found that the more accessible forests had been over-worked and that more distant areas could be tapped only after the construction of roads at much cost. As a result of the Forest Committee's report, a proclamation was made declaring 'royalty' rights over teak trees in the South, and prohibiting unauthorised fellings of teak On 10-11-1806, the Government of Madras appointed Captain Watson of the Police as Conservator of Forests, with a view to organise the production of teak and other timber suitable for the Navy for ship-building Watson was thus the first person in India to be named a 'Conservator of Forests' However, he established only a timber monopoly throughout Malabar and Travancore and arranged for plentiful supply of timber But his methods gave rise to discontent, and in 1823 the post of Conservator was abolished In 1842, Conolly, Collector of Malabar, initiated action that resulted in the world-famous teak plantations of Nilambur The first work was consolidated by the tireless efforts of his assistant, Sub-Conservator Chathu Menon The Court of Directors of the East India Company thus recognised the need to improve the forests of Malabar by forming teak plantations

The necessity for scientific advice in the management of forests was gradually realised by the administrations, and in 1847 Gibson was appointed, in addition to other duties, as their Conservator of Forests by the Bombay Government In 1856, Cleghorn was appointed as the first regular Conservator of Forests in Madras Presidency With these appointments regular steps at forest conservancy began to be undertaken in the Bombay and Madras Presidencies At that time the vast forest tracts in Central Provinces, Bengal and Assam had not even been explored to any extent As regards the forests of Upper (Northern) India, very little information is available regarding their management during the early years of British rule The accessible portions were apparently subjected to heavy unregulated fellings In 1825, Wallich was deputed to enquire into and report on the extensive forests at the foot of the Himalayas His report pointed to the need for conserving the forests of sal and *sissoo* in Avadh and the Terai He recommended that Government should interest itself actively in their management. But the observations that large numbers of sal seedlings occurred every season near the big trees, led Falconer to conclude that the forest wealth was inexhaustible and that the exploitation of the forests could continue unabated The difficulty of establishing the young sal was not realised then The belief that the forests were inexhaustible was also dispelled as more exploitation took place Further, the dense population in Avadh and surrounding areas cleared forests for large-scale extension of agriculture, till towards the end of 1850, when difficulty began to be experienced (particularly in the Punjab) in obtaining the timber needs of the Public Works Department The unchecked exploitation of accessible areas, the forest fires and grazing had all caused gradual destruction of forests in the plains It is interesting, however, to note that plantations had been raised along the Western and Eastern Jumna canals during the period 1820-1840 under the initiative of the Superintendents of the Canal. The trees planted included *sissoo, toon,* sal and teak.

In 1855, Lord Dalhousie, the Governor-General promulgated for the first time an outline for forest conservancy for the whole country by the issue of a Memorandum of the Government of India dated 3-8-1855 This (according to Stebbing) might well be termed as the "Charter of the Indian Forests" The Memorandum resulted from the reports submitted by McClelland, then Superintendent of Forests in Burma (then part of the Indian Empire) In the year 1856, Brandis was appointed Superintendent of Forests in Pegu (Burma) and later came to serve in India Brandis was a fully qualified, scientifically trained forester He had received his training in Germany, at that time the only fine training ground in forestry, besides Nancy in France Along with this scientific training, he possessed all the attributes which go to make a great scientific pioneer His contributions as Inspector-General of Forests of India laid the sure foundation on which India's Forestry developed so satisfactorily in the last hundred years and is what it is to-day

Captain Longden was deputed by Lord Dalhousie to explore and report on the forests of the Western Himalayan Range from Chamba eastwards to the north of Simla. As a result of his exploration of forests in the valleys of Sutlej, Beas, Ravi and Chenab in 1852-53, a Timber Agency was established, with a depot near Sealkote In 1854, a Superintendent was appointed for the forests in Dehra Dun and Rohilkhand

In 1850, the British Association in Edinborough formed a committee to consider the destruction of tropical forests in India. This resulted from

the initiative of Cleghorn. The Committee found that over a large portion of the Indian Empire, there was an almost uncontrolled destruction of the forests due to the careless habits of the population, but that in the forests of Malabar (where the British rulers exercised some supervision) considerable improvement had already taken place and that these improvements might be extended by proper enforcement of forest regulations to the forests over the rest of the country Among other things, the need for forming plantations in depleted areas was pointed out as also the urgency for prohibiting the cutting down of immature growth and the importance of reserving and maintaining forests in high altitudes and in areas of peculiar physical structure The Committee also stated that indiscriminate clearance of forests around localities wherefrom water supplies were derived was greatly to be deprecated

Meanwhile, in South India, though Gibson and Cleghorn commenced their work with limited staff, they devoted special attention regarding the raising of plantations following Conolly's example When alarming decrease in the supplies of first class teak in Malabar forests was noticed, attention was diverted to explore the possibilities of obtaining timber from Anamalai Forests of Coimbatore. In 1854 Michael was appointed Superintendent of the Anamalai Forests, after he had been trained in Moulmein, Burma, to learn the methods of dealing in timber The early working of Anamalai forests was also mostly in the nature of exploitation, but efforts were made by Michael to avoid wasteful methods in his operations He recognized the advantage of using the saw in the place of the axe Till then all timber operations were carried out with the axe only from first to last and the waste was probably more than 50 per cent The statement of Michael in his report, "it will however be my endeavour to work as much as possible with the saw,—eventually (I trust) to the entire exclusion of the axe", would point to the efforts he made in this respect However, for many years to follow, the Indian forests suffered at the hands of the people and the timber contractors and their wasteful methods of exploitation.

In 1856, rules for the conservancy of trees and brushwood in Rawalpindi district were published and in 1857 rules for forest conservancy in Hazara were framed The publication of these rules marked the commencement of much-needed protection for the forest areas of the Punjab.

In the year 1857, the Indian Mutiny occurred. The year 1858 saw the end of the East India Company and rule by the Court of Directors The Royal Proclamation in 1958 declared the sovereignty of Queen Victoria as Empress of India The Mutiny brought out the want of facilities for rapid communication, and the tremendous impetus given to railway construction after the Mutiny caused heavy demands on forests While in the early period of British rule timber extraction was mainly towards supplying the needs of the British Navy, the years following the Indian Mutiny saw the exploitation of forests throughout the country for supplying the enormous quantities of railway sleepers and other material required for railway construction in different parts of the country Forest destruction again went apace, generally.

In Madras, however, apart from continuing the work of raising teak plantations in Malabar, efforts also began for raising plantations in the Nilgiris About 1858, exotic *Acacias* and *Eucalyptus* species were introduced, and this resulted subsequently in the large scale plantations of these species in the Nilgiris During the period 1858-64, importance was thus given to raising plantations on an increasing scale and plantation activity became a recognised part of forest conservancy It is interesting to note that in the first stages of forest management, attention was concentrated mainly on obtaining the required timber Next came the urge to plant in order to replace the loss Only later followed systematic conservation of forests, by taking protective steps against further depredation, and importance was attached to forest protection and guarding the forest against unregulated fellings Scientifically trained staff was progressively entrusted with the task of forest administration, as the need for conservation and improvement work was appreciated Later, regeneration and planting work became an integral part of forest conservancy not only to compensate for the loss caused by removals but also to augment forest resources in order to meet the increasing demands of the population

In 1861, Cleghorn published his book on "Forests and Gardens of South India" It did much to promote forest conservancy in India Cleghorn laid the first foundation of an effective system of forest conservancy in Madras at a time when forestry was very little known in the rest of India Apart from his services to Madras, he also contributed to forestry in the Punjab, where he was sent in 1861 to report on the forests

of Western Himalayas In 1864, he was associated with Brandis, in organising Forest Administration under the Government of India In 1863, the necessity for early demarcation of the Government and village forests in Madras was pointed out by Brandis and Cleghorn In 1882, the Madras Forest Act was passed

In Bombay, the efforts at forest conservancy which began with the appointment of Gibson as Conservator of Forests, continued to make slow, but steady progress Gibson directed his energies to three main objects, viz, (i) prohibition of shifting cultivation, (ii) institution of thinnings in young teak areas and (iii) formation of teak plantations Unfortunately, during this early period, considerable opposition (to the introduction of forest conservancy by the Forest Department) came from some of the District Collectors They were strongly against the advent of a new Department which would take over the administration of the forest portions of the districts But, the growing scarcity of timber and extensive demand for wood of various descriptions, led the Government of Bombay to recognise that the forests had to be strictly conserved and that a specialist agency was necessary for the purpose The Government of Bombay, therefore, decided to place its Forest Department on an efficient footing In 1860, Dalziel, who succeeded Gibson drew up a set of rules in consultation with Goldfinch, then Collector of Dharwai It was decided that the forest establishment in each district would be under the control of the Collector and that the duty of the Conservator would consist in visiting the forests annually for the purpose of advising the Collectors on forest matters The Secretary of State (in his despatch in 1862) did not consider this distribution of duties between two Departments desirable, in view of the past experience of indifference of some Collectors to the interests of forests, however, he allowed the arrangements to be adopted for the time being as an experiment In 1862, the Bombay Forest Department was thus recognized to provide for assistance to the Conservator in 7 places, but the other forest establishments of the districts continued to be under the Collectors Large quantities of timber were supplied to the Navy, the Army and the Public Works Department The forests of the Dangs were taken over on lease and the desirability of taking on lease the jungles of Mehwashi Chiefs was also considered. In his despatch dated 30th March 1863, the Secretary of State wrote in regard to the future management of the Bombay forests as follows· "You will enjoin upon the Collectors the necessity for harmonious cooperation wtih the Conservator and his officers and impress upon them that the proper growth and protection of the forests is as important to the Government as the cultivation of any other crop"

In the forests of the region of Central Provinces, large tracts remained unexplored for a long time In 1861 Government constituted the Central Provinces as a Chief Commissionership Temple, who was appointed the first Chief Commissioner, realised the great part that these forests could play in the economy of the undeveloped province and began to pay special attention to them Captain Pearson was appointed as Superintendent of Forests In his report on the nature and working of these forests soon after the great Indian Mutiny, Pearson has described how these forests were thrown open to timber contractors, with complete freedom to fell to any extent and as they liked "It was only necessary for a contractor whether European or native to obtain a *parwana* or order from the Civil authorities to cut timber, and then he started work, and as every Gond carried out an axe, the forests were soon filled with fallen logs" Only in the later years it was realised that lack of forest conservancy would end in forest destruction The first forest areas that Pearson dealt with with a view to forest conservancy were in the Saugor and Nerbuda territories He was assisted by Lt Forsyth and Lt Douglas, Forsyth wrote his book on "The Highlands of Central India", giving a very vivid account of those forests as they were in those days As a result of a joint inspection by Pearson and Brandis in 1863, it was decided that further forest conservancy work in the Central Province should concentrate on (i) demarcation of reserves, (ii) protection of forests from fire and (iii) assessment of resources from which forest revenue might be raised Within a year rules were drafted for the better management of the forests and the attention of the Government was drawn to the need for prohibition of *Dhaya* cultivation at least in valuable forest areas Though attention of Government was focussed on the forests of the Central Province only after the Indian Mutiny, the zeal and ability displayed by Pearson resulted in the organization of a regular forest department by 1870, within the short period of about three years

During the period 1858-64, the Western Himalayan forests were also subjected to heavy fellings in order to meet the demands for sleepers

for new railway construction, which was being pushed through at a rapid pace in Upper India In 1861, under the direction of the Governor-General, Cleghorn of the Madras Forest Department proceeded to the Punjab for an investigation of these forests Cleghorn thus laid the foundations of the Forest Department in the Punjab also. In 1863, Reid was appointed Superintendent of the Chamba State Forests, which had already suffered from heavy but haphazard working This is one of the rare cases in which the local Rajahs, afraid of the serious consequence of irregular exploitation, took steps to appoint a Superintendent of Forests The forests in the upper reaches of the different valleys in the Punjab continued, however, to contribute a great deal to the supply of sleepers, mostly of coniferous species The forests in the plains were exploited to meet the increasing needs of fuel as well as of the boat-building industry on the Indus

In the North-West Province and Avadh, no attempts at forest protection were made till the middle of the 19th century, when (as a first step towards introducing some regulation regarding forests) the Commissioners were appointed as ex-officio Conservators of Forests In 1860, Ramsey who was the Commissioner of Kumaon and Garhwal took energetic steps to prevent devastation of the forests in the hill districts In 1862, Brandis (who was till then Superintendent of Forests in Burma) was directed to go over to the headquarters of Government of India to advise them on the introduction of a general policy for the administration of the forests of India Brandis visited Bengal, Avadh, the North-West Province and the Central Province and gave advice regarding the steps to be taken to organize forest conservancy Then followed the appointment of Webber as a Forest Surveyor in North-West Province His duties included visiting the forest areas and drawing up of statements regarding the position, area, contents, accessibility of working, etc In 1868 a Forest Department, with its own Conservators, was inaugurated in North-West Province Webber's book, "The Forests of Upper India", gives descriptive accounts of his marches and sporting anecdotes

In the Lower Provinces of Bengal and Assam, scant attention was paid to forest conservancy prior to 1863 In 1862, Brandis visited a portion of the Bengal forests (on his way to join the Government of India) and made a note on the future of the forests of this region. In 1864, Anderson, who contributed valuable data for the purpose, was appointed Conservator of Forests of the Lower Provinces in addition to his duties as Superintendent of the Botanical Gardens in Calcutta Thus, forest conservancy commenced in the 'Lower Provinces' much later than in the rest of this country. In Bengal, till 1863 nothing had been done in regard to the establishment of a Forest Department, and as a result of this neglect, railway sleepers were imported from Norway as supply from indigenous sources in the Lower Provinces was too costly due to lack of forest organization The Assam forests were only just then proposed to be explored in detail

The establishment of the Forest Department under the Government of India

In his despatch dated 1st November 1864, the Governor-General pointed out to the Secretary of State, that the idea of allowing proprietary right in forests to individuals should be abandoned, as such rights were almost certain to lead to the destruction of the forests concerned It was considered necessary that all Government forests should be strictly set apart and made inalienable It was conceded that provision would have to be made for the continued exercise of certain private rights already existing, but it would be a good policy to extinguish even those rights on equitable terms wherever possible The despatch also pointed out the need for (i) exercising great care in the disposal of waste-lands containing forests, (ii) demarcating and fixing the limits of forests to be preserved as such and (iii) enacting a comprehensive Indian Forest Act In order to carry out an all-India Policy in respect of forests, it was considered that an office should be placed solely in charge of forest matters As a result, an Inspector-General of Forests, working directly under the orders of the Government of India, was appointed His business was "to advise them on all questions connected with forest administration, and generally to introduce a thorough system of management and conservation, throughout all the forests in the territories under the Government of India He need not be invested with any power of direct control over the forest management under the Local Governments to whom all instruction on such matters will issue through the Government of India" Her Majesty's Government approved the proposal to make a separate Forest Department under the Government of India for dealing with all questions relating to the forest in the provinces. The despatch from the Governor-General to the Secretary of State on 1s

November 1864 and the Secretary's reply thereto inaugurated the birth of this separate Forest Department under the Government of India and its being placed in the firm and sure hands of Brandis, who played a great part in shaping the forest organization of the country Under the guidance of Brandis as India's First Inspector-General of Forests, the Forest Service proceeded to transform the working of India's forests—from the initial practice of exploiting them merely for obtaining supplies of timber to one of treating them as a biological growing entity of much value and handling them in accordance with principles of scientific forestry

The beginnings of Forest Organization

The period 1864-1900 would mark the next stage in the progress of forestry in India As soon as Brandis was appointed as Inspector-General of Forests, Cleghorn was deputed to assist him They were responsible for the development of a methodical system of forest management in the early stages They realised the necessity for a separate forest enactment, not only for affording protection to the forests, but for bringing them under proper management, with adequate authority vested in the officers of the Forest Departments, for the purpose The Indian Forest Act of 1865 came into being as the first attempt at forest legislation by the British in India Under this Act, the local Governments were empowered to draft local rules for enforcement in their respective regions Steps were taken accordingly to prevent acts which caused injury or destruction to the forests Though some of the local Governments lagged behind in the application of the Indian Forest Act to their territories, all the areas under British rule had either extended the Indian Forest Act to their territory or brought out special Acts by 1882.

Immediately after his appointment as Inspector-General of Forests, Brandis took steps to recruit trained personnel for controlling the work and the establishments of the Forest Department In 1869 there was a reorganization of the Forest Service and all the officers of the various provinces and administrations under the Government of India were placed in one general list and were classified into Conservators, Deputy Conservators and Assistant Conservators Madras and Bombay Presidencies, however, had their own separate lists Brandis also took steps for affording Forest Probationers training in forestry training centres in Europe. But he first selected two gentlemen already trained in forest management in Germany, for service in India They were Schlich, who became a world-renowned forester and Ribbentrop, who succeeded Brandis as Inspector-General of Forests Schlich and Ribbentrop arrived in India (Calcutta—16-2-1867). Brandis's proposal in the matter of technical education for forest officers consisted (i) in providing facilities for officers already in the forest department in India to receive further scientific training in forestry in Europe, and (ii) in selection of young men in Europe for training in the continent before they joined the Indian Forest Department Brandis also outlined proposals for the appointment of Forest Rangers

About 1863, Beddome, then Conservator in Madras, collected systematically all information relating to the working of the forests at that time and produced the first "Manual of Forest Operations" in Madras This could be considered the first effort at management according to a regularly drawn-up Working Plan During the period 1865-70, the planting of Casuarina in the coastal areas of Madras was initiated in order to make good the large quantities of fuel removed from the existing forests to meet the considerable needs of the railways Forest tracts were demarcated to provide for the supply of fuel for the working of the railways In fact, at that time, fuelwood supplies to the railways, formed the major concern of the Forest Department and continued to be so until coal began to be used in India for railway engines The Forest Administration had to devote their energies to maintaining a regular supply of fuel and this resulted in cutting trees over large areas of forests The fuel plantations that were formed were small in extent when compared to the extent of forests that had been worked The Secretary of State was particularly alarmed at the absence of progress in the formation of fuel plantations The large scale demand of fuel for the railways, however, resulted in the Government agreeing to large tracts of waste lands being converted into fuel reserves and their being placed under the Forest Department The period 1865-70 also marked the first attempt at fire protection as a measure of forest conservancy in the Bori Reserve in Central Province

Stewart, Punjab's first regular Conservator of Forests (1864), carried out detailed enquiries regarding fuel supplies required for the railways in that region Sleepers also continued to be supplied from the timber forests in the hills of the Punjab As the first attempts at raising deodar plantations were not successful, Stewart examined the question in detail and considered

that it should be the duty of the Department rather to conserve the existing resources than to raise new plantations of deodar at that stage of forest management in the Western Himalayas. He considered that the best course would lie in felling first class trees, not exceeding 1/3 of the whole stock, in such a manner as to leave convenient space for the growth of the young trees obtained by natural sowing from the remaining two-thirds of mature trees It would thus be seen that Stewart visualised the gradual introduction of shelterwood systems, which were later so successfully developed in the Punjab

In the North-Western Province, forest conservancy continued in the hands of Commissioners until in 1868 Pearson, the first Conservator of Forests in the Central Province, was transferred as its first Conservator to the North-Western Province Though forest conservancy received adequate attention at the hands of a few Commissioners like Ramsey, it cannot be said that all Commissioners evinced the same interest According to Stebbing, the forest report for 1866-67 furnished abundant evidence of how backward the North-West Province was at that time in all that related to true forest conservancy The appointment of Pearson helped in rectifying matters During the period 1865-70 large quantities of timber were made available from the North-Western Province Pearson's Annual Report of the Forest Department 1869-70, however, gives ample evidence of the order which he was introducing in the short period in respect of conservancy of the forests of the North-West Province In Avadh forests, which were under the management of Reid, who was appointed as Conservator of Forests, forest conservancy was introduced on systematic lines as a result of a series of valuation surveys by Brandis, and cultural operations were undertaken in reserved forests Climber-cutting was done over large tracts Survey and demarcation also were in progress during the period

The general inspection of Assam forests began in 1868, when Mann examined the forests of the districts of Lakhimpur and Sibsagar, Nowgong, Naga Hills, Khasi and Jaintia Hills on the south side of Brahmaputra In other words, the rest of the forests of the country had already come under some form of regular management, before the forests of Assam were subjected to any regular study

Organization of forests under regular management

By 1870 the foundations of the Forest Department may be said to have been well and truly laid by Brandis A regular forestry service began to exist and definite progress in forestry was shown During the period 1871-1900 preparation of Working Plans commenced and these were brought into operation in different parts of the country Treatments of the forests were prescribed on scientific considerations In the early years of the Forest Service, the main task of the forest officers had been the exploration of the forests under their charge Then came the arduous task of demarcation of the forests These tasks were obviously carried out by the early forest officers under conditions of great hardship, inadequate equipment and poor means of communication The early members of the Forest Services of India deserve great praise for the remarkably thorough and efficient manner in which they brought into being a Forest Organization in the country, which holds a pride of place to-day in tropical silviculture and management

A revised Indian Forest Act (Act VII of 1878) was passed in the year 1878 and it extended to all Provinces of British India with the exception of Madras, Coorg, Burma, Bihar, the Hissar district of the Punjab, Ajmer and Baluchistan This Act aimed at improving on the inadequacies of the Indian Forest Act of 1865 The Revised Act provided for the constitution of reserved and protected forests The Indian Forest Act of 1865 was not extended to Madras forests mainly on account of the attitude of the Board of Revenue, which held that the rights of the villagers over jungles were of such a nature as to prevent the establishment of an absolute State forest property It was unfortunate that Madras which held the lead in initiating forestry and forest organization in India should have refused to have the Indian Forest Act of 1865 extended to Madras Presidency However, after a visit to Madras by Brandis, who spent nearly a year in making a report on the condition of its forests, the Madras Government appreciated the need to have a Forest Act for the scientific and effective management of forests, and passed its own Forest Act of 1882 During the last two decades of the nineteenth century, some of the forest areas of the country were constituted either into reserved forests or protected forests During the period 1880-1900 forest settlement was actively in progress in the various Provinces At that time, the reserved forests formed only about 9 per cent of the total area of the country The attention of the local Governments was invited to the need of constituting more areas into reserved

forests and for speeding up settlement and demarcation work Ribbentrop's "Forestry in British India" gives an account of the laborious and arduous work which was turned out during the period in regard to forest settlement, demarcation and survey

During the period 1871-1900 further steps were taken for the technical education and training of persons to fill the controlling and executive branches of the Forest Service The early appointments were made with men selected from the Police, the Army or other branches of the public services In 1885, training commenced at Cooper's Hill in England, as difficulty was experienced in the training of probationers on the continent. In 1878 a Forest School was inaugurated at Dehra Dun The school turned out trained Forest Rangers for all the Provinces A Provincial Forest Service was inaugurated in 1891 with a view to recruit in India itself a suitable cadre of forest officers (A full account of the development of Forest Services will be found in Chapter VIII of Volume II)

During the period 1871-1900 considerable progress was also made in Forest Administration Much work went into construction of buildings and development of communications The crude and wasteful ways in which the trees were felled and converted into logs or rough-hewn planks were gradually changed into more efficient methods of conversion During this period fire protection was extended over many of the important forests Improvement of the forest crops was also achieved by increasing the area of plantations The formation of plantations compensated to some extent the destruction wrought to the forests in the past This period also saw much progress in the drawing up of the Forest Working Plans The importance of forest literature and research was recognised and valuable works were produced by Forest Officers during the latter part of the 19th century Their works still form books of reference regarding the flora and fauna of the country as well as on different aspects of development of forestry in India

The first three All-India Officers (Brandis, Schlich, Ribbentrop) helped to establish a sound forest administration They brought to bear on their work a thoroughness and devotion that is reflected in the sound forest administration that they built up during their long tenure of office From the year of the creation of the post to the turn of this century, during most of the time during a period of 36 years, Brandis (19 years) and Ribbentrop (15 years) occupied the post of Inspector-General The presence of these energetic and enthusiastic officers at the helm of forest affairs for such prolonged periods made it possible for a sound edifice of forest administration to be installed in India. They made the Government realize the need for scientific advice on forest matters During their period, the Forest Administration was reorganized in the various Provinces.

Progress of Forestry under the British in the present Century

The first quarter of the present century would constitute the next stage in the progress of forestry in India There was general all round progress in the different fields of forestry throughout this period In particular, scientific aspects of the profession received greater attention In 1906, the Imperial Forest Research Institute was established with six officers—the Silviculturist, Superintendent of Forest Working Plans, Forest Zoologist, Forest Botanist, Forest Chemist and Forest Economist In the year 1914 the main building of the Forest Research Institute was opened by Lord Curzon at Chandbagh, Dehra Dun Inevitably, World War I (1914-1918) had its effect on the forests of the country. The shortage of imported materials caused by the German submarine campaign made it necessary to develop indigenous materials, and towards this end the Forest Research Institute undertook different tests regarding the suitability of local materials

As a result of the movement for Indian Home Rule organized in 1916 and the Non-Co-operation Movement that followed, there was a general defiance against forest laws and damage to forests was caused by fire in some places (Bengal, Kumaon Hills of U P) In Puri, a large number of raids were made by villagers into the nearby forests and trees were cut down In Andhra instances of violence against forest officials were also recorded

In 1901 a separate North-Western Frontier Province was formed, the North-Western Province was renamed as the Agra Province, and the United Province of Agra and Avadh came into being In the year 1911, a composite Bihar and Orissa Province was formed From the forestry point of view, the formation of these Provinces was a welcome development, since it ensured closer attention to the management of areas which did not receive adequate attention earlier.

The original staff of the Forest Research Institute, Dehra Dun in 1906

(1) J H Lace, Principal, Indian Forest College and Imperial Forest Silviculturist, 1906—08

(2) H H Haines, Imperial Forest Botanist, 1906-07

(3) E P Stebbing, Imperial Forest Entomologist, 1906—09

(4) R S Troup, Imperial Forest Economist, 1906—09

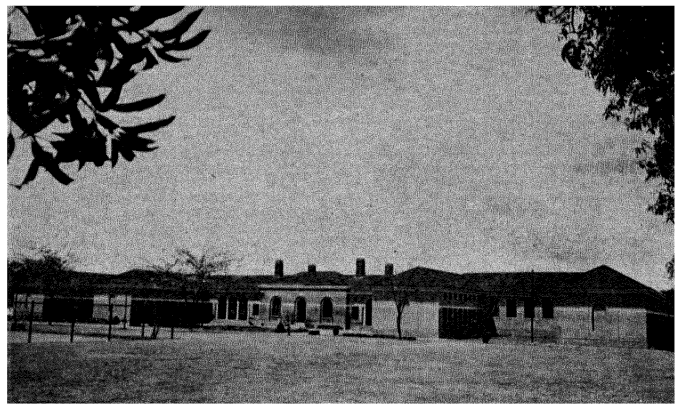
(5) Sardar Puran Singh, Imperial Forest Chemist, 1907—18

The importance of preparing forest working plans on scientific basis was recognised by the various forest administrations The old idea that the forest was mainly a revenue-producing entity was giving place to the recognition of the varied functions of the forest Faith in the value of research and of scientific management for the gradual improvement of the forest estate was also further strengthened With the increasing work in the administration of forests, the number of Conservators in the larger Provinces was increased 'But the presence of more than one Conservator, each in independent charge of forest administration within his Conservatorship, began to cause difficulties With the passage of time the questions presented to the local Governments became more technical in character and difficult of solution The progress made in the preparation of working plans, extension of fire-protection measures and other silvicultural operations and application of results on research required the presence of scientifically trained men at the helm of the Forest Department of each Province The work of the Inspector-General of Forests was also on the increase, as he himself had to undertake tours in different Provinces and make his advice available whenever the local Governments needed In 1905, the idea of having a Chief Conservator of Forests in each Province crystallised incidentally to the reorganization of the Imperial Forest Service The Government of India suggested that each Province where there were more than three Conservators might have a Chief Conservator of Forests The appointments of Chief Conservators of Forests began, however, only from 1917 By 1921, the only Provinces without a Chief Conservator of Forests were Bihar and Orissa, Bengal and Assam Bifurcation of divisions also took place wherever more intensive management of the forests was called for All these resulted in an increase in the number of forest personnel In 1910, a Board of Forestry, composed of the representative Conservators under the presidentship of the Inspector-General of Forests was set up Meetings were held once in three years to discuss the programme of research work as also the problems of general Forest Administration

As a result of the recommendations of the Royal Commission on Decentralisation (1909), it was not considered necessary that the Inspector-General should be called in as an adviser over every working plan In view of the increase in the number of Divisions, it was not possible, either for him to advise on each working plan, and further, scientifically trained forest officers being available in the higher posts in different Provinces, it was possible for the work to be entrusted to them In the Provinces, where there would be a Chief Conservator of Forests, it was considered sufficient that a Chief Conservator does the final scrutiny and check of the Working Plans The Inspector-General of Forests would be asked to advise only on matters on which the local Government desired his opinion With the increasing importance of the working plan work, some of the Provinces created a separate Working Plan Circle in charge of a Conservator With this arrangement, the post of the Superintendent of Working Plans at Dehra Dun was abolished In 1912, the Madras Forest College was started at Coimbatore for training Forest Rangers for Southern India

During World War I many of the younger officers of the Forest Department were called on to serve in the Army, and this threw additional work on the officers left in the Department, especially as they had to deal with the enormous demands for timber and other forest produce from the Military authorities Silvicultural work had perforce to be held in abeyance in some of the forest areas which had to concentrate on other aspects Large scale supplies of timber, firewood and other produce (like hay) were made to the Army Timbers from India's forests were utilised in various mid-eastern fields of World War I The Forest Research Institute at Dehra Dun also carried out important investigations on the possibilities of utilizing the so-called jungle woods, many of which were recognised later as good substitutes for the important materials

The next stage in this history would include the period 1926-47 In the political changes in 1921, 'Forests' became a transferred subject and the administration of its forests came to vest in the Government of the Province concerned In 1926, the Government of India announced the amalgamation of the post of Inspector-General of Forests with that of the President of the Forest Research Institute During the next 20 years, on more than one occasion the question was even considered if the post of Inspector-General of Forests was any longer necessary and whether it should not be abolished However, towards the end of the period, the posts were separated again Since then the post of Inspector-General of Forests has gained in importance, though more in the capacity of adviser to the Government of India than as the head of Forestry in the country Correspondingly, the Chief Conservators of forests in the Provinces became independent heads of



New Building of Northern Forest Rangers College at New Forest

their forest departments, responsible only to their respective Provincial administrations The All-India list for promotions to the ranks of Conservators and Chief Conservators also came to an end in 1935 The Indian Forest Service cadre was set out separately for each Province except for provision in them for deputation to India list posts, viz, the Inspector-General of Forests and President, Forest Research Institute, and the forest officers required for the Forest Research Institute and College at Dehra Dun The unified system of recruitment, training and service conditions, however, continued to serve to keep forestry in the whole country on a well co-ordinated basis A course for training Officers for the Indian Forest Service was commenced in Dehra Dun from October, 1926 Till then all officers of the Indian Forest Service were trained in the United Kingdom and training in Dehra Dun was given only to men of the Provincial Forest Service and for Forest Rangers Recruitment to and training for the Provincial Forest Service ceased with 1926 The world economic depression in the thirties affected the forests of India also And taking into account the large-scale recruitment to the Indian Forest Service in the post-war period (1921-26), the Governments of the Provinces rapidly reduced their needs for highly-paid forest officers, and all recruitment to the Indian Forest Service came to an end in 1930 Direct recruitment of Forest Officers was not revived till 1938 Retrenchment measures were taken and some of the Divisions and Circles amalgamated The position gradually improved towards the end of the thirties and timber trade rehabilitated itself and increased demand for timber, fire-wood and other forest produce occurred The Indian Forest College for the training of Gazetted Officers of the various Provinces started at Dehra Dun in 1938, each Province making its own arrangements for recruitment.

Afforestation works taken up in the Punjab (Hoshiarpur) and U P (Etawah, Terai and Bhabar) for reclamation of *chos*, ravines and other eroded areas during the earlier period, were continued during the period 1926-47 The success achieved initially indicated the need for similar

work on a large scale, in other Provinces also, so that the denuded areas could be reclaimed and at the same time the increasing demand for small timber and firewood could be better met than all along.

During this period, more areas were brought under regular working plans. Wherever a separate Working Plan Conservator had been appointed o supervise the work of the Working Plan Offi-'ers, there was noticeable advance in prescrip-ions for the proper management of the forests :oncerned on scientific basis Major silvicultural problems like the natural regeneration of deodar in the Western Himalayas, the artificial regeneration of teak in South India were successfully tackled and standard procedures evolved. The natural regeneration of sal continued to receive energetic attention

Notable advances in working plan work were achieved in almost all the U P and the Himalayan forest regions in particular, though very scholarly plans were compiled in Madras State also

It must stand to the credit of forest administration that even in the lean years, the forest estate was improved according to working plan prescriptions and that regulated forest working continued to result in surplus revenues to all Provincial Governments

In the late twenties of this century, interest first began in wild life conservation A few sanctuaries were set up in different provinces and pioneers like Milroy in Assam contributed much to stimulate thought in favour of the great heritage of the country in its varied wild life

The Forest Department of the Punjab took the lead in initiating action in matters of soil conservation and focussing attention on the urgency of this problem For many years from about 1935, Hoshiarpur became almost a synonym for soil conservation activities

With the Indianisation of the Indian Forest Service in 1922 (whereby 40 per cent of the vacancies were reserved for Indians), Indian officers became a common part of the Indian Forest Service With the coming in of the Government of India Act, 1935, "Forests", which after great controversy had become a "Transferred" subject, became entirely the concern of the Provinces The Government of India and the Inspector-General of Forests were to concern themselves only with the common or general aspects of Forestry, viz, Forest Research, Forest Education, Soil Conservation, etc. They ceased to have any direct authority or control over the administration of the forests in the Provinces.

In 1926, the Forest Research Institute began moving into a vast estate of its own, in "New Forest", just outside the city of Dehra Dun, leaving the old premises at "Chandbagh" for the use of the new Indian Forest Service College. With the closing down of this College in 1932, this historic centre of forest research became a site of India's first Public School, the Doon School The new accommodation for the Forest Research Institute was planned with great vision and foresight, taking into account the needs for expansion Apart from the designers and architects responsible for this remarkable layout and edifice, much credit must go to Clutterbuck, the then Inspector-General of Forests During this period of the history of Indian Forestry, viz., 1925 to 1947, the research branches and sections were greatly expanded In fact, the organisation itself underwent major changes All this was necessary to cater to the needs of the most notable event of this period, World War II, and the post-War conditions During this war, which came physically much nearer to India, the demands made on India's forests were of much greater magnitude than the demands during World War I Enormous quantities of timber (from almost every wood species) were extracted, causing excessive fellings and advance working in almost all Forest Divisions in the Provinces There were also very extensive overfellings in private forests and forests in the Princely States Many varieties of timber which had not been used previously in any appreciable quantity began to be consumed in large quantities The plywood industry came into its own during this period and many new plywood factories were started, especially in the Calcutta area

Towards the end of the World War II, Howard (as Inspector-General of Forests) made out a note on a Post-war Forest Policy for India mainly in order to rehabilitate the over-worked forests and improve future forest working As a result, a number of post-war development schemes were initiated in the last few years of this period, involving large-scale plantation activity, expansion of and improvement to means of communication and construction of staff quarters and other buildings New forest industries also began to come into existence in different parts of the country some of them big undertakings like the newsprint factory at Nepa Nagar in Madhya Pradesh Each Province devoted greater attention to the preparation and revision of its working

plans. The Forest Research Institute was expanded and reorganised to meet the increasing needs of forestry, forest production and utilization Simmon's work in this respect not only marked a significant stage in the development of the Institute, but also placed it in the vanguard of international forest research organisations

It must also be mentioned that early in this period, Burma ceased to be part of the Indian Empire and was constituted into a separate country Naturally, the forests of Burma became an entity by themselves, administered by a Chief Conservator of Forests But they continued to seek the help of the Forest Research Institute, Dehra Dun, for all research work.

Forestry in Independent India

The last stage in the first century of the history of regular forestry in India began with 1947 This year marks a most important milestone in the history of the country itself, in that the British authority was voluntarily withdrawn to leave it to Indians themselves to shape the future destiny of their country At the same time, India was, mainly in response to Muslim aspirations, partitioned into two countries, India and Pakistan (the former provinces of Sind, North West Frontier Provinces, Western Punjab and Eastern Bengal being constituted into the separate country of Pakistan) The forests included in these areas became the responsibility of forest administrations of the States concerned with a separate Inspector-General of Forests to advise the Central Government of Pakistan in forest matters

With the attainment of Independence on 15-8-1947, almost all the British Officers (who had done so much to the cause of Indian forestry) left the arena and Indian Officers assumed charge (as in other fields of Government) of the Forest Administration in all spheres at the centre and in the Provinces Further political changes followed rapidly, with the Government of India taking effective steps to consolidate the administrative set up in the country As a result, all the Princely States, large and small, were either constituted into States of India or merged into the adjoining Ex-British Indian Provinces Some of the large States like Travancore Mysore, Hyderabad and Jammu & Kashmir had reasonably well organised Forest Departments. Others like Bhopal and States in the Central and Eastern India States Agencies had benefited by advice from trained Forest Officers from the neighbouring Provinces of British India and their forests were in a reasonable state of maintenance. But the forests of the other Princely States had served mainly as sources of revenue, and no measures of forest conservancy had been practised in them The forests of many of these Princely States thus began to have the benefit of regular Forest Administration for the first time, on the same lines as the British had developed in the forests in areas directly under their control There were naturally very considerable variations in the forest laws, forest organisations and forest working in the different units now forming the States of India The task of consolidation of the forests, unification of forest laws, as well as of extension of scientific management on a reasonably uniform basis, became a major pre-occupation for the forest officers

In 1952, the Government of India enunciated a new National Forest Policy, enlarging on the earlier forest policy of 1894 and making good the omissions noticed in it especially with regard to the protective functions of forests Much labour was put in by Chaturvedi (the first Indian Inspector-General of Forests) in the framing of the new Policy Also in 1950-52, new efforts began to (1) adopt a National Festival of Tree Planting (Vana-Mahotsava), (2) to devise measures for 'Wild Life Conservation', and (3) to place 'Soil Conservation' on an all-India footing The latter has since emerged rapidly as a separate organisation, dealing with the problems of Soil Conservation on all lands including forest lands

As a result of new legislation affecting the land tenure systems (Zamindari Abolition Acts) in the different States large areas of forests came also to vest in the Forest Departments Most of these were in a very derelict or over-worked condition and their rehabilitation became a new field of work for the Forest Departments Apart from the consequent increases in the area to be organised and administered by the Forest Departments, extensive programmes of forest development had to be planned, and increased planting activities became the order of the day, with the merger of the post-war development schemes into the first National Plan of Development which commenced in 1951 Artificial regeneration work was organised on a scale not known before, aimed at increasing productivity of all forest sites and thus maximising the resources of timber firewood, industrial wood, etc With the increasing appreciation of the value of the soil and the misuse to which it had been subjected, the importance of forests in conserving soil came to be realised, and large-scale afforestation measures were adopted either

to rehabilitate degraded forests or reclaim ravine and other waste lands Such specially planned forest development involving special large-scale expenditure came to be taken up not a day too early, in view of the excessive working of India's organized forests during the World Wars on the one hand and the degradation and denudation that characterised on the other many of the forests that belonged to the Princely States Zamindaries or to the local population The First Plan was followed by a Second Five-Year Plan from 1956, and at the close of the first century of forestry India is entering the third period of planned development as from 1961

A major political change took place in November 1956, when the country's sub-divisions were re-oriented on a linguistic basis and 14 different States came into being, each covering a major linguistic area A few areas like the Andaman Islands, Tripura (in the Eastern Border), Delhi District and Himachal Pradesh (comprising of the small hill States between Uttar Pradesh and Punjab) continue to be centrally administered With this change, the old Presidencies, Provinces and the large Princely States like Hyderabad and Mysore, all lost their shape and significance altogether and the political map of India assumed a new look This naturally resulted in considerable re-alignment of forest areas also

The Forest Education organisation was also expanded to meet the increasing needs for trained personnel The Indian Forest College which opened at Dehra Dun in 1940 with less than 20 students in its first biennial course developed into an institution capable of turning out up to 80 trained officers annually The capacity of the Forest Rangers' College at Dehra Dun (now called the Northern Forest Rangers College) was doubled The Madras Forest College, which the Government of India took over in 1948, was also expanded to equal the capacity in Dehra Dun It has since been renamed as the Southern Forest Rangers' College To cope with all this expansion, a new post of Director of Forest Education in India came into being as from 1945 The training of foresters on a regional or State basis was placed on a systematic footing Most States have established regular training schools or courses for their forest guards also

A further phase of expansion took place in respect of forest research also, following on the major reorganisation carried out in 1946 by Simmons The facilities for research have been greatly enlarged, especially in respect of Paper, Plywood, Pathology, Seasoning Preservation, Minor Forest Products, etc New fields of study such as Forest Genetics, Ecology and Forest Engineering have been installed The Institute to-day includes 16 distinct branches of study as against the 5 with which it began in 1906 It celebrated 50 years of its useful existence in 1956 It has since been recognised as an International centre for forest research

A new feature in this last period of the first century of forestry in India is the development of international interest in Forestry under the auspices of the Forestry Division of Food and Agriculture Organisation of the United Nations One of the very last acts of the last British Inspector-General of Forests (Hamilton) was to guide the Indian delegation to the first meeting of a F A O Forest and Timber Utilisation Conference held in Mysore, South India, in 1948 This led to the establishment of the Asia-Pacific regional forestry organisation, of which India has not only been a prominent member, but for which India also provided its first technical officer (Purkayastha) This interest of F A O and other international organisations has enabled (1) quite a few Indian foresters to receive training in specialised branches of forestry in institutions in advanced countries abroad, (2) experts from such countries to advise India on its forest development and (3) India to obtain valuable equipment and machinery for the better organization of its forests, forestry and forest research Mention may be made for instance of the United States' assistance in setting up a new pilot-scale paper plant in the Forest Research Institute and F A O assistance in developing logging techniques

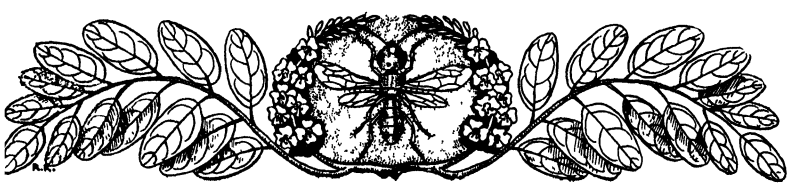
In 1959, the Madras Forest Department celebrated its first Centenary of regular Forest Management and paid tribute to Cleghorn, its first Conservator of Forests Now in 1961, the Centenary of Forest Administration for the country as a whole is being observed Developmental works on an ever-increasing scale, including improvement of forest conservancy, of logging and of communications, and expansion of forest industries, will continue with the inauguration of the Third Five-Year Plan in April 1961 In the meantime, the redoubtable Indian Forest Service comes to an end almost exactly with the first century of scientific Forestry in India The last member of this service will retire from active service in the cause of India's forests, in 1962 The great tasks which lie ahead will, however, be carried forward and further with equal faith and confidence by the younger generation of the

country's forest officers, thanks to the fine and noble traditions built up by the Indian Forest Service

One hundred years are but a small span in the practice of the art and science of forestry and in the development of sound forest administration and Institutions Much remains yet to be learned and done, though it can be claimed that the foundations have been well and truly laid Recent developments in the country pose new problems to the modern forester, but it is to be hoped that the lessons learned in the past 100 years will stand him in good stead May Forestry continue to serve the land and contribute towards a better living for the people of India! *'Melıora Speramus'*.

And here were forests ancient as the hills,
Enfolding sunny spots of greenery.

—Coleridge



CHAPTER II

THE FORESTS

Topography, soil and climate determine the type and quality of the forests The main features of Indian topography are the Himalayan barrier in the north, composed of the highest mountain system in the world, the Western Ghats (hills) running parallel and close to the west coast of the peninsula, the lower and less closely knit system of Eastern Ghats with a wider margin between them and the sea, the plateau country in between (the Deccan), the numerous hill ranges in Assam and the north-east merging into the Himalayan system, and the large stretch of plains lying south of the Himalayas and extending from Rajasthan to Assam, watered by the Ganga, the Brahmaputra and their numerous tributaries The Tropic of Cancer nearly bisects the country, with a little over 13 degrees of latitude to the north and over 15 degrees to the south

The wide range of latitude and altitude has a profound influence on the distribution of rainfall which is mainly caused by two wind currents, one arising from the Arabian sea in the west and the other from the Bay of Bengal in the east, called respectively the south-west and the north-east monsoons The winds which start from the Bay of Bengal and blow steadily for five months (mid-May to mid-October) hit the Himalayas in the north and the hills of Assam on the north-east and cause conditions of heavy rainfall Deflected by the Himalayas the monsoon current precipitates less and less on its westward journey giving rise to zones of decreasing annual rainfall On the other hand, the more northerly of the wind currents from the Arabian Sea have to sweep over vast areas of low hot plains (Rajasthan, Punjab and the western part of Uttar Pradesh), and can only start shedding their moisture at the Himalayan barrier

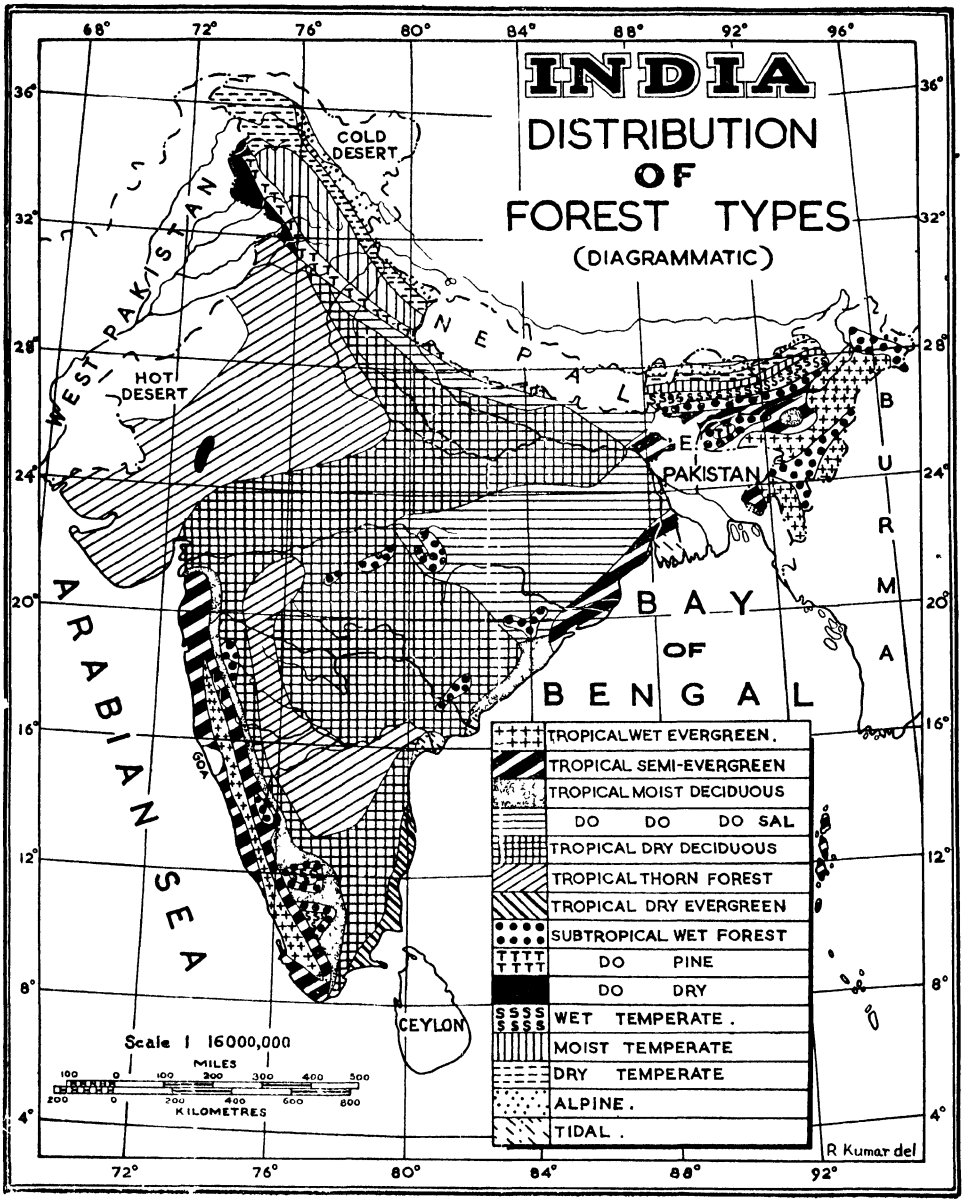
The pattern of rainfall in the peninsular portion is different, the Western Ghats close to the Arabian Sea catching most of the rains as soon as the south-west monsoon strikes land; the winds blowing over the mountains have less and less moisture to shed on the inter-Ghat plateau The East Coast gets parts of its rain through the summer monsoon and part through the winter monsoon (known as the north-east monsoon) Thus there is a large zone in the centre of the plateau which misses the precipitations received by the coastal areas The Andaman and Nicobar group of islands, which are sunken ranges of hills, are again heavy rainfall areas being fed both by the south-west and the north-east monsoons

Temperatures are controlled by humidity, rainfall and altitude, the dry plains above the Tropic of Cancer being much hotter in summer than, say, the coastal region at the southern tip of the Peninsula The variations in climate due to altitude are very clearly noticeable in the Himalayas

The influence of rock and soil is more apparent in respect of distribution of some species rather than on broad types of forest vegetation Climate and topography, therefore, remain the dominant factors which determine the occurrence of forest types

The map showing the broad regions of tropical forests in India has a fairly close correspondence with the rainfall map of the country. Thus Tropical Wet Evergreen forests (following Champion's classification of Forest Types) are generally to be found in areas where the annual rainfall is over 2500 mm (100 inches) (Western Ghats and the hilly areas of Assam and the north-eastern region), Tropical Semi-evergreen in the rainfall regions of 1900 to 2500 mm (75 to 100 inches), Tropical Moist Deciduous where the normal precipitation is 1250 to 1900 mm (50 to 75 inches), Tropical Dry Deciduous in tracts receiving from 750 to 1250 mm (30 to 50 inches) of rain in the year, with precipitations of below 750 mm (30 inches) Tropical Thorn forests are developed, ultimately leading to a practical absence of vegetation in the arid and desertic tracts The gradations from dry to very wet climates and the corresponding types of vegetation (in the reverse order to what has been mentioned above) are easily noticeable in a study from west to east of the trumpet-shaped region bordered on the north by the Himalayas, on the south by the Vindhyas at the western end, and towards the east more or less following the Tropic of Cancer.

Thus if one were to fly over the 25th degree north latitude from the western border of Rajas-


INDIA
DISTRIBUTION
OF
FOREST TYPES
(DIAGRAMMATIC)
COLD DESERT
HOT DESERT
WEST PAKISTAN
NEPAL
E. PAKISTAN
BURMA
BAY OF BENGAL
ARABIAN SEA
GOA
CEYLON
TROPICAL WET EVERGREEN.
TROPICAL SEMI-EVERGREEN
TROPICAL MOIST DECIDUOUS
DO DO DO SAL
TROPICAL DRY DECIDUOUS
TROPICAL THORN FOREST
TROPICAL DRY EVERGREEN
SUBTROPICAL WET FOREST
DO PINE
DO DRY
WET TEMPERATE.
MOIST TEMPERATE
DRY TEMPERATE
ALPINE.
TIDAL.
Scale 1 16000,000
MILES
KILOMETRES
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than eastwards, one would pass over the desert, Tropical Thorn forest, Tropical Dry Deciduous, Tropical Moist Deciduous, Tropical Semi-evergreen on to Tropical Wet Evergreen forest On the other hand, if one were to fly over the 14th parallel from the west coast to the east coast of the Peninsula, one would pass quickly over the narrow belts of Tropical Semi-evergreen (along the foothills), and Tropical Wet Evergreen (higher up), back into another narrow strip of Tropical Semi-evergreen, a narrow belt of Tropical Moist Deciduous, followed by a wider belt of Tropical Dry Deciduous, and a region still wider of Tropical Thorn forest, thence again the process reverses to the Tropical Dry Deciduous and into the Tropical Dry Evergreen [1000 to 1250 mm (40 to 50 inches) rainfall] along the east coast

The Andaman and Nicobar group of islands are covered mostly by Tropical Wet Evergreen forests

In the north the outer ranges of the Himalayas take most of the precipitation The inner hills are progressively drier Cooler temperatures (due to altitude and aspect) and snowfall are the more decisive factors in this region If one were to travel north along the 80th degree longitude from the sub-Himalayan region one would pass over narrow belts of Tropical Moist Deciduous forests (with *Shorea robusta* predominating) Sub-tropical Pine forest (*Pinus roxburghii* being the dominant tree), Moist Temperate, Dry Temperate and Alpine forest types

Three types that have not found a place above in the foregoing brief description of the forest vegetation of the country are (a) patches of montane temperate wet forests (*sholas*) occurring in the Nilgiris and Palni Hills of Madras in elevations over 1,800 m (6,000 ft) (b) small belts of montane sub-tropical wet forests occurring around Shillong and the northern border of Assam, and in parts of Madhya Pradesh, Orissa, Mysore Madras, Maharashtra and Kerala, and (c) Tidal forests which occur mainly in the large Ganga-Brahmaputra delta, smaller formations being seen at the mouths of other rivers on the mainland as well as along the numerous creeks and coastal swamps in the Andaman and Nicobar Islands

A very potent factor in the distribution of forests in the country is Man, who has been continually interfering with natural vegetation all along—clearing and burning it, grazing his cattle, removing forest produce, killing wild life carrying on shifting cultivation, causing erosion, landslides and floods Where rainfall is adequate the jungle may re-establish though of a different composition as in Assam, vast areas of bamboos (especially of *Melocanna bambusoides*) are generally of secondary origin following the destruction of the original Tropical Evergreen forest by shifting cultivation In the poorer rainfall areas of the central and north-eastern parts of the Peninsula, the male bamboo (*Dendrocalamus strictus*) may follow shifting cultivation, or the hills may remain bald and bare, there being little chance for a fresh vegetational build-up under the more severe climatic conditions and biotic factors obtaining here

Man has almost acted as a powerful geological agent, having produced vast and continually spreading ravine systems in the areas drained by the Chambal, the Jamuna and many a minor river or stream whose less spectacular, though nonetheless insidious, influence can be clearly seen by any close observer The treacherous *chos* of hill streams of the Punjab with the fan-wise detrital depositions at the base of the Siwaliks and the frequent floods which they cause in the fertile plains are also the results of his activities during the past few centuries

The present forests of India are the remnants of very large forests which in the distant past covered the entire surface of the country, for, except for some very arid regions of Rajasthan, the stretches of saline soil bordering the Rann of Cutch, the wave-washed sandy beeches along the coast, the snow-clad peaks of the Himalayas and the rocks and boulders of the frigid, windswept, inhospitable higher elevations, India is essentially a forest region, and the Indian climate a forest climate

Forests of the various types are today confined to the hilly tracts and to poor soils Some forests still remain on broken and undulating ground which was found to be too infertile for agricultural crops, but these have undergone severe maltreatment at the hands of the population who live around the margin and often within the forest itself

The hill forests also did not escape human attention and interference Although the populations inhabiting the hill fastnesses were small, their continuous activity over many centuries has reduced the density of tree growth, sometimes substituting bamboos or grasses for regular tree species It is mainly in the Andaman and Nicobar islands that one may still see what truly deserves the appellation of "virgin forests"

Certain kinds of produce of the forests of India were well known outside the limits of the South-Asian sub-continent even in very early times,



Dalbergia sissoo

Pole crop, mean girth 25 9 cm (10 2 in), mean height 9 144 m (30 ft) on elevated river bank subject to erosion, Dehra Dun, Uttar Pradesh· trees infested with climber *Dregea volubilis* —F. R I. Collection.

Long before the advent of the British, rosewood, satinwood, teak, ebony and sandalwood were regularly exported to Arabia, Persia and other western markets Indian teak was used by Arabs for building their once powerful fleet which used to sail the Arabian Sea, the Bay of Bengal and other parts of the Indian Ocean on to Malaya, East Indies and beyond However, a regular forest policy and planned administration of forests came into being long after the British obtained a firm foot-hold in this country, for the British themselves were ignorant of forestry and more interested in revenue and trade. The first prompting towards forest administration came by way of anxiety regarding the dwindling supplies of teak used as a good substitute for their own ship-building oak timber Although the far-sighted Collector of Malabar, Conolly, started raising teak plantations (with the help of his trusted and devoted lieutenant, Chathu Menon) during the 1840s, it was not till well after the middle of the 19th century that the idea of forest conservation took concrete shape in India

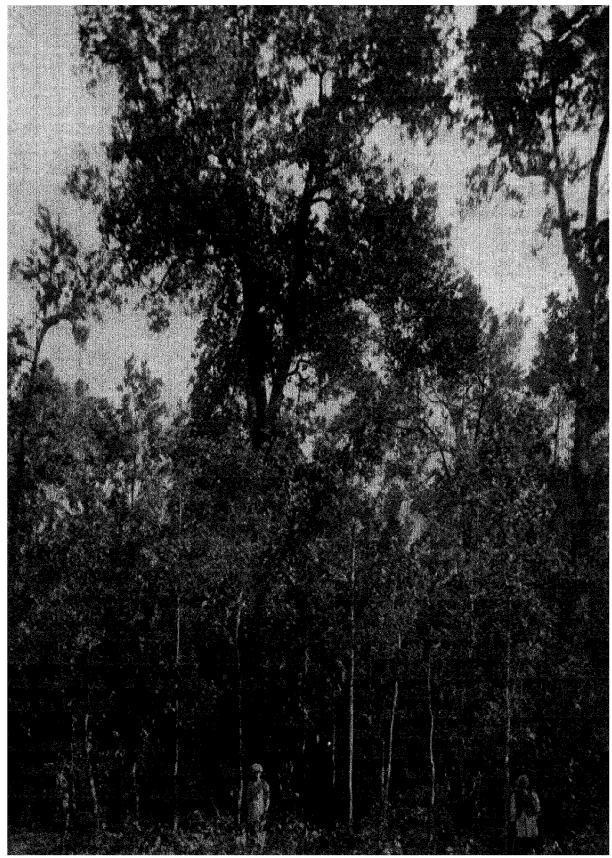
A central forestry training school was started in 1878 and a research unit in 1906 at Dehra Dun, these were later to grow into the present Forest Research Institute and Colleges, perhaps the biggest set-up of its kind in the world.

The total forest area of the country according to the latest statistics is 784, 558 sq km (302,918 square miles), which is 24 per cent of the land surface Of this, reserved forests comprise slightly less than half, being only 47 per cent. The protected forests and unclassed forests form 30 per cent and 23 per cent respectively The former are mainly private forests which have been taken over since Independence by the various State Governments for management in order to save them from destruction These are at present in a poor state indeed. But far worse is the condition of the Unclassed State Forests which are just stretches of barren land from which almost all woody material has been removed by an improvident population and all grass destroyed by continual over-grazing of their hordes of emaciated cattle The most dispiriting features of these forests, however, are their weak legal status and the fact that many of them are still under the control of the revenue authorities who have no field staff to look after the forests

The outstanding feature of the tropical forests briefly outlined earlier is their complex composition. In the upper canopy there is a multiplicity of trees, only a few of which are accepted as good timbers in the market. Very few tree species are gregarious in the sense that pines are in temperate climates Often, therefore, the marketing of the timber presents a difficult problem as large quantities of a particular kind of superior timber are in demand The felling, logging and carting of a number of weak, refractory and non-durable (or often just less known) timbers to distant markets was hardly a paying proposition, till recently There are some forests, however, where past human interference (burning, grazing of cattle, etc.) has retrograded them to a stage where one particular species of tree (and this a useful one) becomes predominant, being better equipped to withstand the maltreatment than a number of its less hardy associates Such forests, in spite of the manner of their origin, have a significant place in economic forestry.

Two outstanding examples may be cited One is that of sal (*Shorea robusta*) which occupies two main regions separated by the Ganga-Brahmaputra plain In the north a long belt of sal forest stretches along the sub-Himalayan tract from the Punjab (Ambala) through Uttar Pradesh, Bihar and West Bengal into Assam as far as Darrang. In Assam it is also found south of the Brahmaputra in Kamrup, the Garo Hills, Khasi and Jaintı Hills and Nowgong South of the great northern plain, the sal begins in the south-western districts of West Bengal and extends through Bihar into Orissa up to its southern border (Jeypore and Ganjam), and westwards into Madhya Pradesh (Raipur, Bilaspur, Mandla, Balaghat and Jabalpur). The forests where sal occurs fetch very much better revenues than the neighbouring blocks devoid of sal.

In a similar manner teak occurs in the Aravallı Hills of Rajasthan, in parts of Gujarat, Maharashtra, Madhya Pradesh, Andhra Pradesh, Mysore, Madras and Kerala. It is by no means continuous but occurs in larger or smaller blocks in suitable localities, reaching its best dimensions on the West Coast (Mysore and Kerala) Teak-bearing forests are far more valuable commercially than non-teak forests of the same region The high "per hectare" revenues of Kerala and Mysore are mainly due to this, though sandalwood also accounts for considerable forest



Shorea robusta *forest worked under concentrated regeneration fellings, immediately before final removal of overwood in even-aged crop, well established Thano forest, Dehra Dun—F R I Collection.*

revenue of Mysore Although subject to severe conditions (fire, over-grazing by cattle, etc) and hence of stunted growth, the dry tropical forests of some parts of Madhya Pradesh, Maharashtra, Gujarat and Rajasthan fetch good revenues because of the presence of the teak

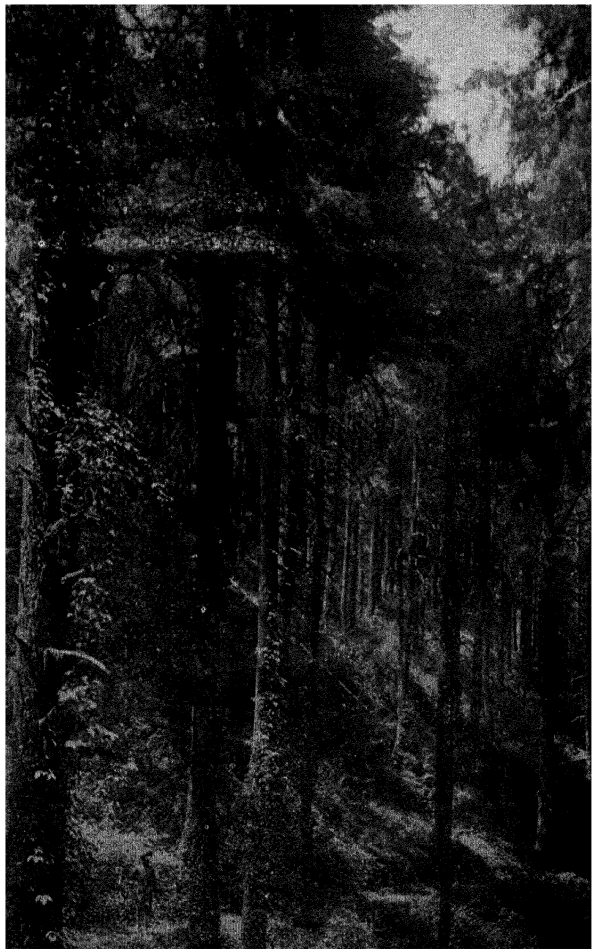
The endeavour of Indian foresters over the century has been to increase the content of valuable species in the forests or to replace forests of little worth by better species by planting

The three important species of Himalayan timbers occurring in large quantities are *chir* pine (*Pinus roxburghii*), deodar (*Cedrus deodara*) and to a certain extent the blue pine (*P wallichiana*) All of them are conifers and, as happens generally with conifers, they are gregarious The most accessible of these forests are those of *chir* pine which are to be found in the outer ranges and principal valleys of the Himalayas and on the ridges of the Siwalik hills flanking the Himalayas, the altitudinal range of this species is fairly wide, with a lower limit of 450 m (1500 feet) and an upper limit of 2300 m (7,500 feet) The deodar occurs most commonly at elevations of 1,800 to 2,600 m (6 000 to 8,500 feet) from Garhwal (in Uttar Pradesh) westwards through Himachal Pradesh and Punjab into Kashmir often reaching up to 3000 m (10.000 feet) or more on southerly slopes and down to 1,200 m (4,000 feet) on the cooler aspects The blue pine favours the same elevations as the deodar and often occurs in mixture with it, though it does occasionally ascend up to 3,600 m (12,000 feet)

There are other Himalayan conifers such as fir spruce, yew and hamlock which occur at higher elevations, or cypress which is very patchy and local in its distribution But the extraction of deodar and blue pine from the elevations at which they occur already poses difficult problems, and the economic exploitation of the forests situated higher up must await a satisfactory solution of the transport question

Even with the many handicaps hampering the development of forestry in India, considerable advances have been made both in the field and in experimental gardens In respect of the former may be mentioned demarcation of forests, construction of roads and buildings, establishment of labour colonies in remote areas, enumeration of useful trees and the estimation of their volume, making Working Plans and laying down prescriptions for various items of work to be carried out in each forest, carrying out silvicultural operations for obtaining natural regeneration, thinning of congested crops, and, above all, the raising of plantations of useful species such as sal, teak, rosewood (*Dalbergia latifolia*), champ (*Michelia champaca*), *gamari* (*Gmelina arborea*), *semul* (*Salmalia malabarica*), *toon* (*Cedrela toona*), *sissoo* (*Dalbergia sissoo*) and other important timber species, as well as supplementing natural regeneration of deodar and other conifers with nursery-raised seedlings Numerous trials with exotic species from Europe, Africa, the New World, Japan, China and Australia have also been made Only a few have so far been found useful for planting on a large scale, chief amongst them are *Eucalyptus globulus* (blue gum) and *Acacia mollissima* (wattle) of Australia, which have been extensively planted in the Nilgiris and Palnis of Madras and *Cryptomeria japonica* (*suji*), a Japanese species, whose seeds were originally obtained from China along with seeds of tea (seeds from trees of that origin formed the basis of many plantations in the forests around Darjeeling) *Eucalyptus citriodora* and a eucalypt hybrid have been found very useful for raising pole and firewood plantations in the drier tracts of Mysore, Madras and Andhra Pradesh Along the coast, impressive plantations of casuarina have been built up both by Government and private agencies in West Bengal, Orissa, Andhra, Madras and Kerala

In the matter of research too, excellent work has been done in timber testing, wood preservation, seasoning, timber engineering, wood mechanics, Botany, (collection, and identification of plants), Entomology, Mycology (the study of fungi, the diseases they cause and their control), Minor Forest Products (including oils, gums, dyes, medicines, perfumery, tannins, fibres, flosses, etc), Pulping and Paper-making of Volume and Yield Tables and many other aspects of forestry and forest products To mention only a few of the most outstanding contributions, these are the making of paper using bamboo as raw material, the development of Ascu, an important wood preservative, the improvement of the qualities of many secondary Indian timbers by seasoning, compression and impregnation to serve as suitable substitutes of imported woods for bobbins, shuttles battery separators, pencil slats, ammunition boxes, sports goods, boot lasts, etc , the designing of structures using short-length and small-dimensioned timber of principal as well as secondary species, the use of tamarind seed kernel powder as a sizing material for cotton textiles and



Forest of spruce (Picea smithiana) 2500 *m.* (8500 *feet*) *Jaunsar, Uttar Pradesh.*

jute products, the development of the match industry based on *semul* (formerly considered a worthless timber) and other soft-wooded species, the building up of the plywood industry, the making of diaper wood, investigations on sandal-wood oils and the oleo-resin from *chir* pine leading to the establishment of big industries for the manufacture of sandal-wood oil, gum turpentine and gum rosin, etc

One direction in which much headway has yet to be made is in respect of logging and extraction of timber, especially from mountainous regions For this purpose equipment in the shape of steel cables, carriers, motors, mountain tractors, etc will be required—none of which items are being manufactured in the country There is also a need to introduce improved logging tools such as better axes, saws, bill-hooks and the repair kit necessary to maintain them in an efficient working condition The use of winches and cranes for hauling, loading and unloading has to be resorted to more and more in order to minimise delays and costs With current difficulties in regard to foreign exchange it will not be possible to import the tools and equipment in sufficient quantity Rapid progress in this direction can only be achieved with the further development of the steel and its ancillary industries

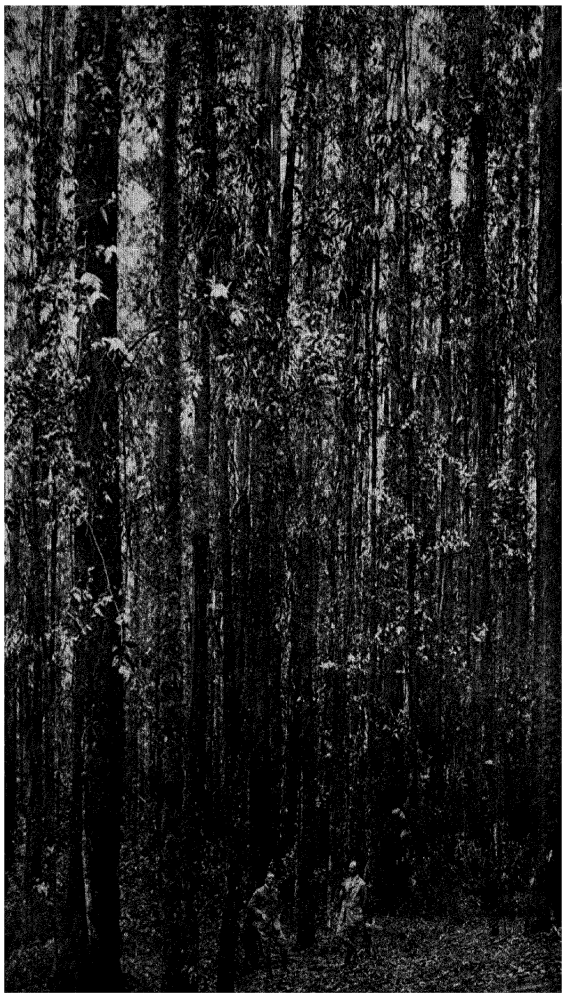
A more immediate and urgent need is that of the creation of extensive plantations of fast-growing soft-wooded species for meeting the growing demands of the paper industry and of those that can manufacture particle boards, fibre-boards, chip-boards and similar processed wood Processed wood will have to step in more and more to meet a variety of wants It is estimated that over the next 15 years it would be necessary to raise 6 million hectares (15 million acres) of plantations of fast-growing species in order to satisfy future requirements This is a task to which the foresters of India have to address themselves with determination and zeal.

Wild life is an integral part of the forests Recent attitude towards forestry in the progressive nations emphasizes the need for appreciating the multiple-use aspects of forestry—timber production, protection of the environment, provision of sport and recreation There is (or used to be) a great abundance and variety of wild life in our country which has been depleted by the clearance of forests, cultivation of sparsely wooded wild country, reclamation of swamps, indiscriminate shooting and trapping outside reserves, mass-hunts accompanied by forest fires in tribal areas, and recently through an enormous increase in poaching Some animals and birds such as the *cheetah* and pink-headed duck are extinct. Others such as the Kashmir stag and the Great Indian Bustard are in a precarious position The Indian lion, the great Indian rhinoceros and the wild buffalo are being protected with great effort Many animals and birds are being trapped and are being exported alive, or their furs, hides and plumage are sent abroad Although the trade may be lucrative while the supplies last, there is no doubt that unregulated trading of this nature will end in the extinction of the species

A large number of sanctuaries have been set up such as Kaziranga (Assam), Corbett (Uttar Pradesh), Kanha (Madhya Pradesh), Tadoba (Maharashtra), Bharatpur (Rajasthan), Gir (Gujarat), Pakhal (Andhra Pradesh), Bandipur (Mysore), Mudumalai (Madras) and Periyar (Kerala) The Indian Board for Wild Life keeps a watch on the status of the wild life and advises the States on legislation and other steps to be taken for conservation of wild animals and birds The development of sanctuaries and the provision therein of amenities for visitors (including foreigners) should help in countering the claim that a more liberal policy on shooting and capture of wild life and the export of live animals or skins and plumage would considerably improve our foreign exchange position

The total production of wood from India's forests is estimated at about 17 million cu m (600 million cu ft) of which 31 per cent or 5 million cu m (190 million cu ft) constitutes industrial wood or timber and the balance 69 per cent or 12 million cu m (410 million cu ft) fuelwood (including charcoal wood) Because of the poor condition of the forests other than Reserved Forests and the inaccessibility of some of the latter the output appears small Moreover, this does not take into account the large quantities of timber and firewood removed from Protected and Unclassed State Forests annually by right-holders and concessionaires The value of forest produce as received by the Government is over $500 million, of this less than half is expended on forest operations and staff About 600 000 persons are engaged directly in primary occupations connected with the management and exploitation of forests Very many more obtain employment in trades and industries dependent on timber, firewood or other forest products

Apart from yielding produce, the forests perform the great task of preventing floods, keeping alive the springs that feed the streams during the



Eucalyptus globulus high forest plantation before thriving, age 30 years, after thriving mean girth 3 ft. 11 in , mean height 143 ft , before thriving, stems per acre 628 , solid volume per acre 15832 cu ft. Mutinad plantation, Nilgiris.—F R. I. Collection.

dry weather, checking soil erosion and exerting a beneficent influence on the climate Forests are important to any country To tropical countries they have a special significance in relation to soil, water and climate Without the protective influence of forests, agriculture languishes in the tropics It has already been seen that in the present day context, industry too is dependent on the raw materials from forests

It is essential that there should be a full appraisal of these matters by all those who are interested in the progress of the nation so that there may be whole-hearted cooperation at every stage in the implementation of the forest policy which was clearly enunciated in 1952 by the Government of India and which is being constantly brought to the notice of the States by the Central Board of Forestry

The Sandal tree as if to prove
How sweet to conquer Hate Love,
Perfumes the axe that lays it low!

—Tagore



Shorea robusta forest of best quality just thinned Jalpaiguri, Bengal Mean girth, 2 ft 3 in mean height, 100 ft. stems per acre after thinning, 156, volume of standing crop, 3,764 c ft , volume removed in recent thinning, 765 c ft , estimated age, 60 years.—F. R. I. Collection.

CHAPTER III

FORESTS AND THE COMMUNITY

The fact has to be faced that the general attitude of the people to forests is one of indifference, and to forestry, one ranging between antagonism and tolerance Some of the hostility to forests as a natural environment is perhaps instinctive to the human race Man's first home was the forest and he preserves memories of encounters with dangerous carnivores and other animals which were his fellow denizens in the forest His ascent in the scale of civilization from the hunting and food gathering stage through the stages of pastoral nomadism, shifting cultivation and permanent agriculture to the present urban industrial phase has been accomplished by clearing the forest and pushing it back to the hills There is consequently a tendency to regard every act of forest clearance as yet another step in the march of civilization

In Western countries this attitude of antipathy to forests has been largely overcome Economic developments combined with education have helped to engender in the people of those countries an appreciation of the value of forests as the source of wood—an indispensable and versatile natural product—as the home of many forms of wild life which would become extinct if the forests were to disappear and as a powerful and economic means of moderating the climate, maintaining stream flow and water supply and preventing soil erosion Recognition of these values leads in those countries to the adoption of sound forest policies which enjoy popular support

In India, however, the situation is somewhat different Our forests have been under systematic management for a hundred years We have evolved and enunciated an excellent forest policy Our forest flora is rich and varied and we produce some of the finest woods in the world In addition to wood, our forests yield a large range of so-called minor forest produce, which includes sandalwood, many kinds of bamboos, ivory, gums resins, flosses, drugs, dyes, tanning materials, etc Yet it is open to serious doubt whether our forest policy enjoys positive popular support and whether our citizens in general appreciate the value and uniqueness of their forest heritage with its great wealth of tree and animal species

We may as well recognise that the attitude of the people towards forest management depends on how near the forests they live Those who live in or near the forest as a rule dislike the restraints and regulations inseparable from management and often do not see any justification for them Those who live far away from the forests are not interested in forestry To this second category belong most of our legislators and our educated classes

There are several reasons for the lack of interest in forests and forestry among our lawmakers and literate people Only a very small percentage of them has ever seen a forest or been inside one They are not to blame for this Indian forests, properly so called, have now been driven so far away from the plains where the schools, colleges and the main centres of commerce and industry are situated, that it costs much effort and money for a plains-dweller to visit a forest for study, recreation or sport Add to this the sad fact that by education and temperament we are not, as a people, greatly interested in nature—in trees, birds, animals, insects, scenic beauty—and it is easy to understand why the great majority of educated people in the country live and die without ever having been in a forest or indeed wanting to see one

The people who live in or near forests resort to them for grazing their cattle, collecting firewood or small timber for their needs and exercising any rights to forest produce that they may enjoy They get some seasonal employment in any departmental or contractors' works that may be going on in the forest in their vicinity They are generally intolerant of purely protective regulations This is especially the case in degraded interior forests, where forest management is as a rule limited to the passive role of stopping the people from doing various things in the forest and the forest guard is little more than a forest policeman In such cases the objects for which the restrictions are imposed are generally not well understood by the people Passive measures of conservancy in scrub or dry, deciduous forests are of course necessary and beneficial, and in most cases are all that the departmental budget can afford, but their effects are slow and not readily apparent

The basic problems of forest management in India arise from the following causes —

(i) Low productivity of dry deciduous and scrub forests A considerable part of our forests occurs in regions where the rainfall is less than 40 inches and consists of mixed, rather open formations with a sprinkling of timber species Where such forests occur within economic range of large towns, they are regularly worked under the coppice system for the supply of firewood and charcoal to them and thus provide some local employment Elsewhere the forests are worked (often only nominally) for minor produce through the agency of lessees Such forests frequently adjoin villages and are heavily grazed over and suffer much from fires set by the grazing interests Their employment value is low on account of their low productivity For the same reason they cannot be developed and improved without heavy investment of capital Despite their poor financial return, forestry is still the best land use in such areas as they provide both pasture and small timber while securing for the locality the protective benefits of permanent vegetation

(ii) Continual pressure for disforestation Forests which adjoin cultivation may be said to be under permanent siege There is a more or less persistent clamour for throwing the forest boundaries back for the extension of cultivation or for securing safety from wild animals, or for "standing room" for cattle or other similar pretexts Encroachments in the forest are not uncommon and present a difficult problem as there are often political repercussions to attempts to reverse a *fait accompli* Part of the difficulty in preserving the integrity of such forests arises from their low productivity—a point already referred to There is a traditional but misguided belief that forests are reserves of land for the extension of cultivation and that conversion of "jungle" lands into crop lands, regardless of suitability or productivity, is a sign of progress and a means of adding to the revenues of the State When land is required for a new project—for a dam site, an irrigation canal, road building, a factory, an aerodrome—it is unhesitatingly sequestered from Government forests, even when alternative privately owned lands are available A forest officer who protests against such gradual erosion of the forest estate appears in the unfavourable light of a reactionary blocking progress and pursuing a "dog in the manger" policy

(iii) The old sanctions for forest protection have lapsed and new ones have yet to be forged

In pre-Independence days, the penal provisions of the Indian and Madras Forest Acts were in the main sufficient deterrents to the commission of forest offences on any large scale This was because magistrates as a rule dealt firmly and severely with forest offences in consonance with the then prevailing Government policy There has been a change in this respect and punitive measures are no longer adequate for ensuring the protection of forests It is of course right and proper that in a democratic society the security of the forests should rest not on the fear of possible consequences of infractions of the forest law, but on the willing consent of the people, especially those who are directly concerned, based on an appreciation of the direct and indect benefits conferred by the forests When the direct benefits are relatively small, and in any case are taken for granted as is the case with grazing facilities for example, and the intangible benefits are the more important, popular cooperation in protecting the forest is not readily forthcoming

Forest management including protection in an under-developed, predominantly agricultural economy is always more difficult and less popular than in industrialised countries Where the pressure of the population on the land is great, as in many parts of India, it is not surprising that landless people cast covetous eyes on land sealed off in reserved forests In non-industrialised communities, the main use for forest produce is as firewood or timber for constructional purposes When industries develop to any substantial extent, this situation changes, in that not only is wood used directly as fuel or as a constructional material, but becomes increasingly a raw material to be processed into plywood, pulp, chipboards, hardboards, etc Secondary species and species which are not marketable for timber purposes assume value as industrial raw materials Notable examples are bamboo for paper making and *Salmalia* (*semul*) for match splints Industrialisation would thus have the effect of drawing people off the land, finding uses for our unmarketable species and generally "valorising" our inferior forests.

The development of wood-based industries may have an important influence on the management policy relating to our inferior mixed deciduous forests The demand for specific raw materials from compact areas to feed industries may make it remunerative to replace such inferior forests by concentrated plantations, which can be worked on short rotations With the notable exception of teak plantations, Indian forestry has hitherto leaned heavily on nature for the rehabilitation of degraded forests and for the regeneration of worked forests This has certainly meant economical management, but the results have been slow and, so far as regeneration is concerned, generally disappointing With the rising demand for wood for industrial purposes and the rise in the prices of all timbers, the time seems opportune for a bold departure from what may be termed the "nature" policy in favour of artificial plantations

It takes many decades, often more than a century, for our principal timber species to reach exploitable size, usually taken as 2 ft diameter This is one of the major handicaps of forestry as compared with agriculture or pasture Advances in silvicultural techniques have made it possible to save time by accelerating the rate of growth of the trees Advances in timber engineering and in wood processing industries have made it less important to grow large-dimension timber The trend is definitely towards shorter rotations

The forest performs manifold functions, each of which is important It yields timber and other forest produce, it mitigates the rigours of the local climate, protects the soil and regulates stream flow, it provides a home for wild life, it affords recreation All this is undoubtedly true But the continued existence of our forests depends less on their value than on a widespread appreciation of their value To gain this appreciation much education is necessary Even more important is to adopt policies in which the people who live near the forest and resort to it for various purposes are given a stake in its preservation and management The new departures in associating local panchayats with the management of forests in the vicinity of villages are of great significance

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O leave this barren spot to me!
Spare, woodman, spare the beechen tree

—Thomas Campbell



CHAPTER IV

WILD LIFE THROUGH THE AGES

Introduction

Wild Life is one of the most gracious gifts of nature to this great country, as rich in its variety and colour as in its number The majestic lion, the graceful but fearsome tiger, the powerful elephant, the nimble deer, the picturesque peafowl, the gorgeous parrots, pheasants and woodpickers and the elegant swan are some of these of which any country might be proud It is estimated that there are about 500 species of mammals, more than 2,000 different species of birds (about 1/10th of the different kinds of birds known to inhabit the earth), many species of fish, reptiles and amphibians and more than 30,000 forms of insects, which dwell in the Indian subcontinent In the absence of human interference, this wild life, which is an important constituent of the natural biotic complex, could exist in a state of equilibrium and in harmony with its environments, governed by the inexorable law of the survival of the fittest But man, for his selfish ends, has been ceaselessly persecuting wild life, without appreciating its great value and importance, thereby seriously upsetting the balance of Nature and creating serious problems for himself As a result, several useful species of animals and birds have, of late, dwindled in number Some have become rare, some are at the threshold of extinction, while quite a few have become totally extinct and are lost to posterity for even, such as the Great One-horned Rhinoceros, the Lion, the Elephant, the Wild Buffalo, the Musk Deer, the Kashmir Stag, the Indian Wild Ass, the Snow Leopard, the Pigmy Hog and the Cheetah or the Hunting Leopard

The Rhinoceros has been saved only by special measures, which if relaxed, will inevitably lead to its extinction In Assam, their number had dwindled to a little more than a dozen about 50 years ago and it is only as a result of intensive efforts of the Forest Department that their number has now increased in the Kaziranga Sanctuary A close relative of the above, the lesser One-horned Rhinoceros which, not long ago, had been an inhabitant of the Sundarbans of Bengal and other tracts, has completely disappeared from India The Asiatic Two-horned Rhinoceros also once occurred in parts of Assam.

The Lion, which is reported to have been found in Northern and Central India as late as in the thirties of the last century, has completely disappeared from these parts and is now confined only to the Gir Forests of Saurashtra Even there, the situation became alarming in about 1913, when Wellinger, the then Divisional Forest Officer, Junagadh State, made a report to the Administrator that there were only 6 to 8 lions left in an area of 700 sq miles Restrictions were, therefore, imposed on the shooting of lionesses and cubs and a limit was imposed on the number of lions that could be shot As a result of this timely protection, the 1936 Lion Census of the Gir Forests showed a total count of 287 lions in that region as against about 100 recorded in 1913 From 1936 to 1946 the number again decreased and therefore rigid protective measures had to be imposed in 1946 Subsequent censuses carried out in April 1950 and April 1954 indicated the lion population to be 200 and 290 respectively

But for the timely promulgation of the Elephant Preservation Act in 1879, this magnificent animal would also have been eradicated by the great ivory hunters But nothing was done to save the Indian Cheetah or the Hunting Leopard of the Deccan which has now completely vanished some 30 years ago from India

Certain birds too have met a similar fate The Great Indian Bustard has become quite rare This bird wants long stretches of grasslands, which are now being ploughed up Also, the nomadic tribes are hunting it and destroying its eggs The pink-headed duck, the white-winged wood duck of Assam and the Red Mynas are some of the other birds which are threatened with extinction

Historical Account

Wild Life in India has passed through several phases Starting from its hey-day in the Vedic period, it has steadly diminished

Vedic Age

Our mythology, ancient art, literature and folk-lore all provide ample proof of the fact that in the days gone by wild life in India enjoyed a privileged and prominent place in the life of the people Our scriptures enjoined a humane and considerate treatment to all animals and birds,

Our religion would become very much the poorer without the feeling of compassion and loving kindness towards them There is nothing surprising in this attitude It has been our tradition, and it is a precious one

"*Ahimsa Paramo Dharmah*" has been a cardinal guiding principle of our way of life The Purusha Sukta invokes peace and happiness to all men and animals In Kautilya's *Artha Shastra,* there are significant passages which indicate the recognition given by the statesmen in those days to the problem of wild life preservation Certain forests were declared as protected and called *Abhayaranya*—what we now term as Sanctuaries and National Parks Forest Superintendents were appointed for their maintenance and guards were posted to prevent poaching Heavy penalties were prescribed for offenders who entrapped, killed or molested deer, bison, birds or fish in an area declared as protected Certain animals and birds were completely protected such as elephant, horse, animals with human form, peacock, partridge, swan, cuckoo, fish in tanks, etc Animals which became vicious were to be trapped and killed outside the sanctuary so as not to disturb the others The extraction of timber, burning of charcoal, collection of grass, leaves and fuel, cutting of canes and bamboos and trapping for fur skins, teeth and bones, were all totally prohibited in these protected areas

The most effective means of protection and conservation of wild life, in those early days, was however provided through religion The protection of animals and birds was considered a sacred duty The Indian sages lived in forests and their *ashrams* were seats of learning, where the best in our ancient culture was born Here also lived animals and birds, more or less as their kith and kin and roamed about freely without any fear of molestation

In scriptures, wild animals and birds occupy as important a position as man himself or even higher In the *Ramayana,* we read about the monkey-god, Hanuman, the wise bear, Jamvant, and the loyal eagle, Jatayu, who helped Rama to fight the evil perpetuated by the demon king Ravana and restore peace and tranquility on the land

The various incarnations of the Lord, such as *Meen* (fish), *Kurma* (tortoise), *Varaha* (boar) and *Narasi* (human form with a lion's head) all go to show how the ancient inhabitants of this country stretched their imagination in identifying the Creator of the Universe with the various forms of Wild Life Ganesha—the elephant-headed god—occupies a distinct and unique place in the pantheon The elephant has been described as the favourite of god Indra and its sanctity has been further enhanced by the belief that elephants guard the eight celestial points of the compass Similar veneration has been attached to the various forms of wild life by associating them with gods and goddesses and thus affording protection and preservation to their community Nandi (bullock) as the mount of Shiva, Garuda (Brahminy kite) of Vishnu, Swan of goddess Saraswati and a host of others Goddess Durga took the lion as her charger in the fight against the forces of darkness and evil It is because of this association that the lion has become the symbol of *dharma* (righteousness) In the days of yore kings, when dispensing justice, sat on Simhasana, the seat of the lion The lions' heads adorn the Ashoka Pillar, which is now the motif of the emblem of the Republic of India

Wild animals and birds have also been a great favourite with writers, poets and artists In the well-known *Panchatantra* and *Hitopadesh,* a variety of animals and birds have been mentioned, such as lion, bull, jackal, tortoise, crow, mouse, monkey, crocodile, camel, elephant, crane, cat, serpent, owl and sparrow Children still love to listen to these tables of birds and beasts, and derive much inspiration to build up their character Much has been written about the melodious songs of Indian birds by our poets Animals shown on the Sanchi stupas, the Ajanta cave frescoes and at the Khajuraho temples are a proof of the hold they had on the imagination and the affections of the people In short in ancient India, much attention was paid to the preservation and conservation of wild life and the object was achieved by attaching sanctity, veneration and importance to the individual forms according to the beneficial role played by them for the human society It, however, does not mean that there was a complete ban on the killing of wild life Harmful animals and birds were destroyed for the protection of crops, human life and property Hunting was also indulged in by the kings and nobles but they tracked and shot only the selected trophies, and not indiscriminately

Hindu Period

In the early Jain and Buddhist period (§00, B C) also, we find considerable stress on the religious sanctity of various animals and birds With the passage of time, however, conditions changed and forests also started receding, as more land

was brought under cultivation The forests which provided timber for the first Indus Flotilla constructed by Alexander the Great in 325 B C were no longer there Gone with them were the rhinoceros and the elephant, tiger and the swamp deer Other animals commonly found in the valley also became increasingly rare To check this depredation, the first practical step, which incidentally is the earliest known record of measures taken for the protection of Wild Life in the world, was the proclamation of King Ashoka in the third century B C for the protection of fish, game and forests The rock inscriptions give a list of birds, beasts, fishes which were to be preserved The Edict further ordained that the forests must not be burnt, either for mischief or to destroy living creatures

Moghul Period

For the period, 1526 to 1707, much interesting information concerning wild life is available in the memoirs of the Moghul Emperors and the chronicles of European travellers in India in those days The Moghul Emperors were very fond of shikar but at the same time they were great lovers of nature and displayed keen interest in the wild life of the country and its preservation

The concept of management and conservation of wild life during the Moghul period may, in short, be defined as that of the "Chase" Game was protected and preserved in hunting reserves called *Shikargaha* for the primary aim of providing sport to the royalties

When the Moghuls first came to India in 1526 rhinoceros was found along the Indus and Emperor Babar is reported to have come across it in the plains of the Punjab The elephant was also found in many places from where it has since vanished The last remnants of the wild buffalo survive in parts of Assam, Orissa and Madhya Pradesh In 1822 lions were reported to be found in considerable numbers in Saharanpur and North Rohilkhand and in 1830 they were seen in Mt Abu and Sabarmati regions, but now they are confined only to the Gir Forests in Gujarat

Moghuls also tamed and trained some of the wild animals and birds like the Cheetah, the Caracal (or *siah-gosh* as they called it), the Falcon and the Hawk as aids to hunting and for following their quarry Akbar is reported to have kept a thousand Cheetahs for this purpose

British Period

There was an abundance of wild life in India before the British rule Later, the increase in population together with the control of diseases both of men and animals resulted in more demands for land and the frontiers of wild life began to recede This decline gathered momentum from about the middle of the 19th century, with the increase in the number of high powered and dependable weapons Indeed the doom of wild life was, as it were, sealed the day gunpowder was invented

Army officers, tea-planters and civil servants were, in many cases, heavy despoilers of game In Kathiawar, a cavalry officer is reported to have shot as many as 80 lions in 10 days, while on one occasion 14 lions were shot in a day in the Gir Forests

In the oriental Sporting Magazine of 1876, it is recorded that a sportsman in the Bengal Duars fired about 100 shots at rhinos in a single day, killing 6 and wounding more than 25 F B Simson author of the "Sport in Eastern Bengal", it is recorded shot 500 to 600 tigers during 21 years of his stay in India at the close of the last century

It was not long before this contagion spread to the ruling princes also For example, in the shoot organised by a Maharaja between 1871 and 1907, it is recorded that no less than 370 tigers, 208 rhinos, 430 buffaloes and 324 *barasinghas* (swamp deer) were shot, in addition to innumerable other small game and birds Another Maharaja shot 616 tigers during his life time, and another holds the 'proved' record with over 1,100 tigers to his credit In Kashmir, one sportsman accounted for 58 613 wild fowl between 1907 and 1919, averaging over 4,590 birds per annum In Bikaner the record for the shooting of Imperial Sandgrouse at the Gajner lake was 1,100 birds with 35 guns in 2 days In a shoot at the Keoladeo Ghana Lake of Bharatpur 4,273 duck and geese were shot

Second World War and after

During the War years, heavy depletion of wild life took place, wherever armies were encamped Later with the advent of Independence, the problem of food production assumed paramount importance Vast areas of forests were cleared, in many cases with quick mechanical means, to provide new fields and farms Every effort was made to eliminate all enemies of crops, whether animals, birds or insects, and even encouragement was given to protect the crops Crop-protection guns were allowed to be used for hunting within 3 mile radius of any village Under the guise of the so-called vermin destruction, much slaughter of deer and other game animals thus took place.

Conclusion

To the cumulative effect of the War and the country-wide expansion of agriculture must be added that of larger numbers of gun-licences being issued since Independence This has inevitably resulted in the emergence of a new type of ruthless and unscrupulous 'sportsmen' (sic) having scant regard for the unwritten nibs of sportsmanship They hunt and shoot not for sport but for economic gains by selling meat and skins And when, in addition to these heavy odds, we take into consideration the deadly potentialities of the jeep fitted with blinding flashlights for hunting game by night, it can be imagined what odds our wild life has now to face in its desperate struggle for survival

The problem therefore needs urgent and concerted efforts on the part of all thinking men The Natural History and the Wild Life Preservation Societies and the Wild Life Board, which was inaugurated at Mysore in December 1952, are doing yeoman service in this direction, but much remains to be done in the form of education and propaganda to awaken the masses and to bring home to them the importance and utility of wild life Legislation, rules and regulations are no doubt helpful, but the real remedy lies in creating wild life consciousness in the people.

Trees mean Water,
Water means Bread,
And Bread is Life

—K. M. Munshi



CHAPTER V

FORESTRY EDUCATION: HISTORY AND DEVELOPMENT

Introduction

The development of Forestry Education, or the training of foresters to manage India's forests, has been intimately connected with scientific management and conservation of the forests In his memorandum of August 3, 1855 that has come to be regarded as the Charter of the Forests of India, Lord Dalhousie drew pointed attention to the need for setting up a forest organisation to ensure scientific management of forests to meet the ever-increasing demands for timber An Act for forest legislation was passed and Conservators of Forests were appointed in Madras, Oudh, Kumaon and Burma In the beginning the forests were manned by men drawn from the Civil Services and the Army Brandis, the first Inspector-General of Forests soon recognised the need for fully qualified and scientifically trained officers to help him in the administration and conservation of the forests of the country Regarding selection of these officers, Brandis wrote "Attention should particularly be paid to scientific requirements, specially in natural sciences, and they should be competent to survey a forest and to plan and construct forest roads Although climate and vegetation in India are different yet the fundamental principles of forest management are the same everywhere and persons whose practical experience is supplemented by scientific education, will be able to apply these principles in the forests of another country"

The Government of India approved of Brandis's suggestion and authorised him to select two trained forest officers from Germany or France Two German forest officers W Schlich (later Sir William Schlich) and B Ribbentrop were selected and appointed as "Special Assistant Conservators" in 1867, the former was posted to Burma and the latter to the Punjab

Brandis also visualised bringing into existence a full-fledged service of scientifically trained officers at an early date and, therefore, made further proposals for providing trained forest officers to man the forest service of the country He recommended:

(i) Provision of facilities for studying forestry in Europe for untrained officers of the Forest Department of India,

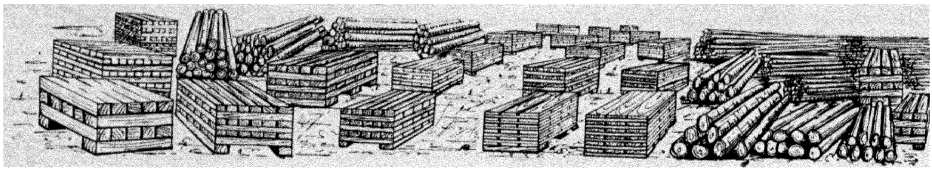
(ii) Selection of probationers from Europe and making arrangements for their training in the continent,

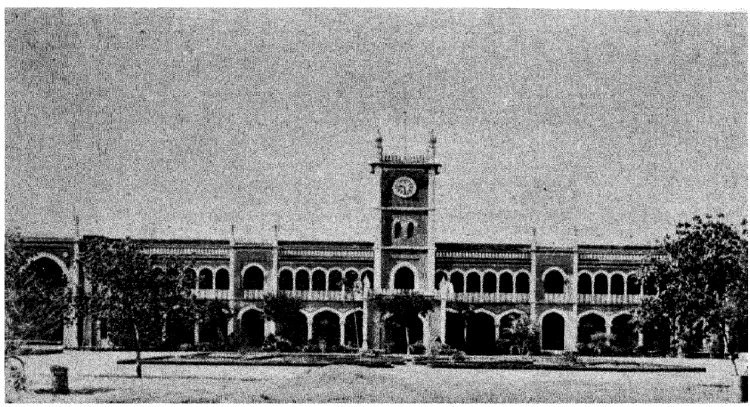
(iii) A general scheme for permanently improving the administration of the Forest Department of India by sending out trained men from Europe

He stressed the point that there were important differences between the general system of management in the continent and that practised in England and Scotland—and the former was more suited to India

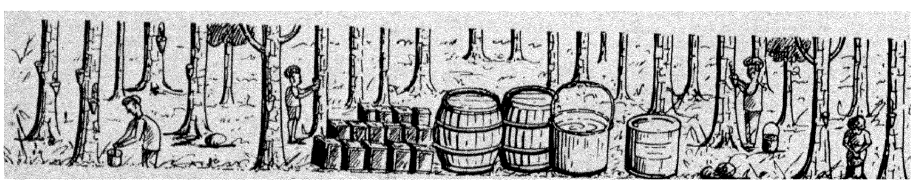
The recommendations made by Brandis were accepted by the Government and he proceeded to make arrangements with Monsieur Laydekar, Directeur-General des Forests in France and Forest Director Burckhardt in Germany, for conducting the courses The instructions issued by Dr Brandis for selection of probationers in 1866 were —"Forest Officers in India frequently live isolated, far from immediate control of their superior officers, they require tact, consideration and sound judgment in their constant, and often difficult, dealings with the local population Moreover, the fatigue and exposure, which the work necessarily entails, are great and the malaria in most of the forests is an undentable fact We require, therefore, pre-eminently picked men of a high moral character, a good constitution even temper and superior abilities, and it may be found, as a rule, advantageous to give preference, *ceteris paribus*, to young men of good family connections"

In 1867, five candidates including an Indian, Framjee Rustomjee Desai, son of a Bombay merchant, were selected to undergo the training in France As it was considered necessary to train some officers in Germany also, two more candidates were sent to Hanover for training under





The Southern Forest Rangers College at Coimbatore



Forest Director Burckhardt The period of training suggested by Brandis was two-and-a-half years

The outbreak of war between France and Prussia brought to an abrupt close the probationers' training in France, as the Nancy School was closed down The probationers were transferred to Scotland where their training was continued in the University of St Andrews under the supervision of Dr Cleghorn, who had served as a Conservator of Forests in Madras The six probationers who were selected for training in January 1871 were thus all sent to Germany The break was, however, temporary and training in France was resumed after a short period The training in Germany continued up to the year 1875 when it had to be abandoned due to certain difficulties For the next decade, probationers for the Indian Forest Service were trained at Nancy only

In all, 95 officers were recruited between 1867 and 1886 and trained in the Continent of Europe

Training in U.K. at Coopers' Hill : (1885—1905)

Owing to certain difficulties, the proposal for training forest officers in England was mooted The first batch joined the Coopers' Hill College in 1885 and Dr Schlich was appointed Professor of Forestry During the first few years, the course of study extended over twenty-six months and was run much on the same lines as that in the Continental Schools Twenty-two months were spent at the College and four months under supervision in selected British and German forests In 1888, Schlich submitted proposals for extending the course to three years

For the selection of probationers a competitive examination was held annually by the Civil Service Commissioners and the qualifying candidates joined the College in September The Forest College at Coopers' Hill ran for about 20 years (1885 to 1905), turning out 173 probationers, many of whom turned out to be eminent foresters

Training at British Universities of Oxford, Cambridge and Edinburgh: (1905—1927)

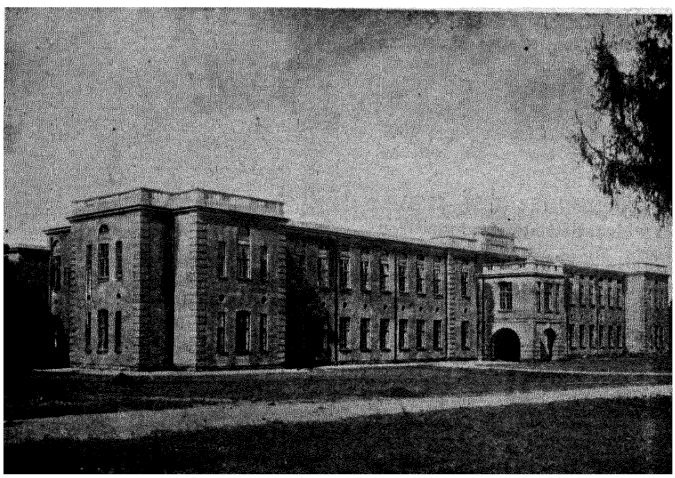
When the College at Cooper's Hill was closed down in 1905, Schlich had the choice of transferring the training of forest probationers to any of the Universities at Oxford, Cambridge or Edinburgh At that time Edinburgh was the only University in the country which had a lecturership in Forestry created since 1887 Lieut Col F Bailey (who was the first Director of the Forest School at Dehra Dun) occupied this post from 1889 Schlich, however, decided on Oxford and the India Office made a grant to the University in aid of the new School

In 1907, Cambridge University inaugurated a Forestry School and appointed a Reader in Forestry The Universities of Cambridge and Edinburgh represented against the preferential treatment of subsidizing the Oxford University alone A conference was called at the India Office in July 1910, at which representatives of the three Universities were accorded equal recognition as training centres for the probationers of the Indian Forest Service

In 1911, a post of Director of Indian Forest Studies was created and A M Caccia was appointed to the post His duties were to maintain a general supervision over the studies of the probationers at the three Universities and to personally conduct the men on tours in the Continent and in England With outbreak of War in 1914, recruitment ceased After the cessation of hostilities, Major Caccia (who served in the Army during the War) was re-appointed to the post for a period of 5 years and continued until 1925 when the post was terminated

A Commission on the Public Services called 'Islington Commission" visited India in 1913-14 and took evidence on Forestry Education The question of training probationers for the Indian Forest Service in India, at Dehra Dun where a Forest Research Institute had been established in 1906, was considered The forest educational experts negatived such a possibility on the ground that in the absence of forests which had been under expert management for one or more rotations, such as were found in the continent of Europe, the practical training would not be up to the mark The training of the officers for the Indian Forest Service, therefore, continued at the British Universities

Soon after the War, demand for probationers increased and between 1919 and 1923, 152 probationers were trained The Government of India desired that all probationers be trained at one centre A conference was held in India in April 1920 to consider the proposal to train the probationers at the Forest Research Institute, Dehra Dun, but no decision could be arrived at In September 1922, however, the first Indian Legislative Assembly recorded their opinion that all probationers for the Indian Forest Service should be trained at Dehra Dun, in accordance with the recommendations of the Islington Commission The proposal was later supported by the Lee



The buildings at Chandbagh (now the Doon Public School) which housed the Forest Research Institute from 1914—1929

Commission (1923—24), which also recommended that the recruitment to the Indian Forest Service should be on the basis of 25% Europeans and 75% Indians. The Governor-General in Council finally decided to inaugurate the training of Indian Forest Service Officers at the Forest Research Institute, Dehra Dun, from the 1st of November 1926.

Training in India at Dehra Dun: (1926—1932)

The Indian Forest College at Dehra Dun started in 1926 and 12 students, including two probationers selected by the Government of India, attended the first course held during 1926—28. The course continued until 1932, when it had to be closed down due to lack of demand for officers. The total number of candidates trained during the period was 27, of which 14 were Government probationers for the Indian Forest Service, 5 States' nominees and the rest private candidates.

Since the inauguration of the training for the Imperial Forest Service in 1867 and till it came to a close in 1932, the total number of trained probationers appointed to the Indian Forest Service was 580. A break-up of this figure as to where they were trained is given below —

Where trained	Number of Officers
Germany	25
France	72
Coopers' Hill (U.K)	173
Oxford University	203
Cambridge University	55
Edinburgh University	38
Dehra Dun	14
Total	580

The Superior Forest Service Course, 1938 onwards

The training of the gazetted officers of the Forest Department remained suspended from 1933 to 1938 when demand for training such officers arose again. 'Forest' was by then a transferred subject under the control of the various provinces and princely states and recruitment to the Indian Forest Service had ceased. Superior Forest Services were created in the States to replace the Indian Forest Service and a course of training for these officers was started in 1938 at the Forest Research Institute, Dehra Dun. The first batch consisted of 16 students. The College was named the Indian Forest College and was located in one of the blocks of the main building of the Institute.

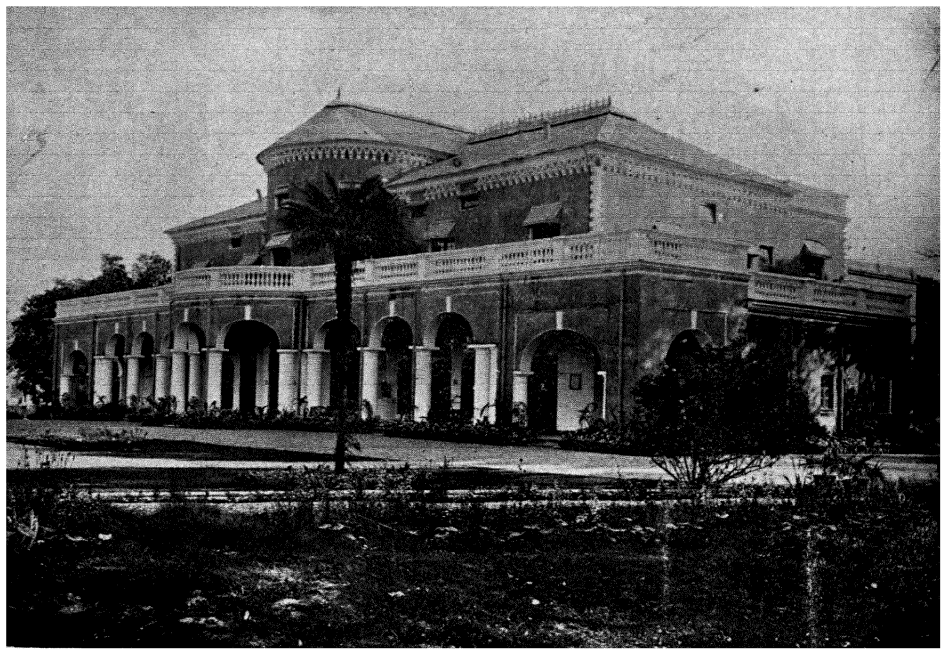
The number of trainees at the College has since considerably increased and the present intake is about 80 to 90 students annually. To meet this increased demand for training, construction of a separate spacious college building has already been taken in hand this year. The activities of the College have considerably expanded and it has established a good reputation amongst the foresters of the world. The Forest Research Institute and Colleges have been recognised by the Food & Agriculture Organisation of the United Nations as an International Centre for the study of Forestry in the South-East Asia and the Pacific region and students from other countries are also being trained.

During the period 1933 to 1938, when facilities for training Superior Staff for the Forest Departments were not available in India and in some cases even after 1938, a few States sent their candidates for forestry training to Edinburgh and other Universities in the United Kingdom.

The Provincial Service Course

The proposal to constitute a Provincial Service was first mooted in 1891 with a view to meet the increased demand for trained officers at a comparatively lower cost. This service was to form a link between the Imperial Service and the Subordinate Executive Service. In the early years of the inauguration of the service, young men mostly of European extraction came into the Service but instructions were soon issued to confine recruitment to the promotion of Rangers of proved meritorious service only.

When the Research Institute at Dehra Dun came into existence in 1906, the status of the Imperial Forest School, which had been training Rangers since 1878, was raised to that of a College, called the Imperial Forest College and, in the same year, a third-year course was introduced for training selected Rangers for admission to the Provincial Service. Experience however, showed that the training given to the Rangers for an extra year was far from satisfactory. A separate two years' course was, therefore, started in the year 1912 and only graduates in science were eligible for admission. The first two batches were trained at the existing Rangers School and from 1916 the College moved to Chandbagh.



The Imperial Forest School, Dehra Dun, where the Forest Research Institute had its beginning in 1906 It is now a wing of the Northern Forest Rangers College

The total number of officers trained in this course, during its existence from 1912 to 1928, was 199 [out of this some went to Trinidad, Malay States and Gold Coast (Ghana)] With the commencement of training of Indian Forest Service Officers at Dehra Dun, the Provincial Course was abolished in 1926

Training for the Subordinate Executive Service

As early as 1869, Brandis recognised that it was not enough to train only the Upper Controlling Staff but that some technical training had to be provided to the lower grades also A beginning in this direction was made by placing selected persons under officers qualified to impart such instructions Later it was decided to attach such persons to divisions for a year or two and then to send them to the Engineering College at Roorkee or some other Engineering College for a theoretical training in surveying, levelling and elements of Civil Engineering The training so provided no doubt produced some good men but the results in general were not as desired Therefore, in 1877, Dr Brandis suggested having a cadre of executive officers above the grade of the subordinate of the protection establishment and below the officers of the inspecting and controlling branches of the service This gave rise to the formation of the cadre of Forest Rangers With the objective of imparting systematic technical training to this class of officials, a Forest School—the first Forest School in the British Empire—was founded in 1878 It was called "Central Forest School" and was housed in an impressive building in the heart of the city of Dehra Dun

The forests of the Doon Valley and those of the neighbouring hills of Chakrata were set aside as 'School Training Forests' and formed into a separate Circle under the control of the head of the School, who was known as the Director Captain Bailey (later Colonel) of the Royal Engineers was appointed the first Director of the School In 1884 the Government of India took over the management of the School from the Government of the North-West Province (U P) and put it under the supervision of the Inspector-General of Forests

In the beginning, only practical instructions in the forest were imparted The first theoretical course with a strong practical bias started in 1881 Two courses, one in English and the other in Hindustani, were conducted for the Ranger's certificate and Forester's certificate respectively In 1884 the School was renamed as the Imperial Forest School With the increase in the activities of the department, a higher course for Sub-Assistant Conservators' Certificate was added in 1889 which continued for several years In 1906, with the inauguration of the Forest Research Institute and Colleges, the status of the School was raised to that of Forest College and named the Imperial Forest College Sometime later, the Forester's Course was discontinued The training of Forest Rangers continued till March 1933, when the College had to be closed temporarily on account of the cessation of recruitment resulting from the general economic depression

The College re-opened in April 1935 under the old name and continued to train Forest Rangers In 1938, the old name was changed to Indian Forest Rangers College The instructions covered a period of 2 years, and till 1942 the intake was biennial Thereafter, due to increased demand, training facilities were increased to enable yearly admissions The strength of the class continued to increase, till in 1945 fresh arrivals numbered seventy-five—far too many to be trained in one class Two classes had thus to be formed for this batch The existing building could not accommodate the enlarged classes and therefore a new spacious building was constructed at New Forest in 1949 Temporary hutments were constructed for use as hostels and the senior batch is now accommodated at this wing, while the junior batch stays at the City Wing of the College

In 1912, the Government of Madras started a Forest College of their own at Coimbatore The College provided training for Rangers in English and was to be run on the same lines as its counterpart at Dehra Dun To start with, it was housed in Municipal buildings, and then moved into its own buildings in 1915 The College has a fine museum attached to it, known as the Gass Forest Museum

Though initially started by Government of Madras to train their own Rangers, the College subsequently catered to the needs of the Central and South Indian Provinces and States and Ceylon also After successfully working for over 27 years, it was closed in 1939 for want of adequate number of students From 1912 to 1939, 640 Rangers were trained The College was reopened in 1945 by the Government of Madras In 1948, in pursuance of their policy of centralising forestry education and to organise and co-ordinate forest research in India, the Government of India took over the College On 1st April 1955 its name was changed as the Southern Forest Rangers College Consequently, the Indian Forest Rangers College, Dehra Dun, had also to change its name for the fifth time and it is now called the Northern Forest Rangers College.

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These Ranger Colleges have been recognised as International Centres for Forestry Training by the Food & Agriculture Organization of the United Nations and are catering to the needs of the neighbouring countries also Quite a few candidates from Afghanistan, Burma, Ceylon, Ethiopia, Iran, Malaya, Nepal, Sikkim, Bhutan Thailand, British Guiana, Uganda and Ghana have passed through the portals of these institutions

Some of the other erstwhile Provinces and Princely States viz, the Provinces of Bengal and Bombay and the Princely States of Mysore and Travancore, also started Ranger Courses to train their Range Officers but these were short-lived and now all the States send their Ranger candidates for training, either to the Northern Forest Rangers College at Dehra Dun or the Southern Forest Rangers College at Coimbatore

Training of the Lower Subordinate Executive Staff

The training of Foresters and Forest Guards has primarily been the responsibility of the various State Forest Departments except for a short spell of the period 1952—1960, when a Regional Foresters' School was run by the Government of India at the Southern Forest Rangers College at Coimbatore This Foresters' School catered to the needs of the States of Madras, Andhra Pradesh, Mysore, Kerala and Andamans The medium of instruction was English and the duration of course one year The School trained 196 Foresters during its short life of 8 years

The Present Pattern of Forestry Education in India

A detailed account of the present pattern of Forestry Education in India is given in Volume II The training of the Gazetted Officers and Forest Rangers is conducted by the Government of India on behalf of the States at Dehra Dun and Coimbatore This ensures a uniformly high standard of education and helps in creating an *esprit de corps* amongst the Forest Officers of the States, which is very essential for an integrated management of the forests of the country based on the Forest Policy enunciated by the Government of India The selection of trainees is done by the States either through their Public Service Commissions or by a qualifying examination conducted by the Rangers' Colleges The rules of admission, the curriculum and the syllabus have been framed by the Government of India Training of Foresters and Forest Guards is conducted by the States themselves

India is now self-sufficient in the matter of imparting scientific Forestry training of a high standard to all ranks of its foresters

CHAPTER VI

THE FOREST SERVICES

Higher Administrative Services

As detailed elsewhere, there appears to have been no particular efforts in India at organised forest administration or management prior to the 19th century Individual officers or staff were assigned duties, part-time or whole-time as the occasions called for, in connection with disposal of forest produce, particularly standing timber, and collection of revenues therefrom, or preservation of the forest for its value as Royal hunting grounds The early period of British rule in India was no exception On the other hand, there was considerable increase in felling, especially of fine timbers like teak for the British Navy It was about 1805 that doubts arose for the first time that supplies of timber might run short In 1806 the first Conservator of Forests was appointed with Malabar and Travancore as his jurisdiction To Captain Watson of the Police thus fell the honour of being the first Conservator of Forests in India A proclamation of 1807 formed the basis of the Conservator's authority By 1823 due to the growing discontent among timber merchants and on the recommendation of Sir Thomas Munroe, the then Governor of Madras and with the consent of the Supreme Government, the Conservatorship in which Captain Watson had been followed by others, was abolished after it had been in existence for a bare seventeen years

Almost another quarter of a century passed before any staff came to be appointed specifically for taking care of the forests It was in Southern India that the first seeds of the future Forest Service of India were sown In 1847, Dr Gibson was appointed Conservator of Forests in Bombay Presidency, and nine years later Madras followed suit and appointed Dr Cleghorn (1856) as Conservator of Forests The first steps towards the formation of a forest organization in India were contained in a report of McClelland, Superintendent of Forests, which he submitted to the Government of India in August 1853 McClelland was succeeded in 1861 by Brandis who has been aptly named the Father of Indian Forestry Thanks to his constant endeavours and excellent personal example, the State Forests of India have since been organised, administered and developed into a well-knit, productive estate—by the labours of successive bands of men of great hardihood, pioneering spirit, scientific acumen and untiring zeal These men belonged to the following regular services—

The Indian Forest Service—from 1867 to 1932

The Provincial Forest Service—from 1906 to 1926

The Superior State Forest Service—from 1940 onwards

The cadres of Forest Rangers—from 1881 onwards

How these developed is examined below in some detail —

Very soon after his appointment, Brandis recognised the urgent necessity to secure the assistance of some qualified and trained officers, if he were to place on a sound basis, the conservation and administration of India's forests He realised also that for work in the higher branches of forestry, he should not rely entirely on untrained staff however zealous and receptive they might be to new ideas While his suggestions did not find acceptance straight away, Brandis persevered with his proposals to the Government of India, recommending that one trained officer each (recruited either from Germany or France) be sent to the Punjab, North West Provinces, Central Provinces and Burma, to be placed in charge of the more important Forest Divisions as soon as they got themselves acquainted with the country, language, people and the forests "For the districts under their charge" wrote Brandis, "they would arrange methodical working plans, dividing each forest into such blocks and compartments as the working plans require, they would carry on the operation of felling and thinning, as well as planting and improving the forests where necessary and practicable, where required, the means of timber transport would be improved and the administration of the district would be placed on a satisfactory footing" He continued, "in selecting such persons, attention should particularly be paid to scientific requirements to survey a forest and to plan and build forest roads Although climate and vegetation in India are different, yet the fundamental principles of

forest management are the same everywhere and persons whose practical experience is supplemented by a scientific education will be able to apply these principles in the forests of another country" It was thus that the basic principles were enunciated, under which recruitment in Europe followed for the next sixty years for manning the senior grades of the Forest Departments in India It is hardly necessary to add that, as a result, a well-knit body of forestry experts was brought into being and the Forest Estate of India assumed its present valuable and permanent shape, size and productivity

In their despatch to the Secretary of State (Revenue-Forest No 10, dated 25th June, 1866) the Government of India approved of the suggestion of Brandis and stated that the Lieutenant Governor of the Punjab and the Chief Commissioners of Central Provinces and of Burma were strongly impressed with the advantages to be derived from carrying out the proposals The Secretary of State authorised Brandis to select two gentlemen trained in forest management from Germany or France on Rs 500 per mensem (The Government of India had cut the salary to Rs 400 but Brandis said that he could not recruit men for this low salary and the Secretary of State supported him) They were to be allotted for works in the Punjab and Burma respectively A forester was also to be recruited from Scotland on Rs 200 per month for work in the Central Provinces.

For these two first posts in the superior grades, Brandis selected two German officers, viz, W Schlich and B Ribbentrop, who arrived in Calcutta on the 16th February 1867 They were designated as Special Assistant Conservators and posted, the former to Burma and the latter to the Punjab Thus began the Indian Forest Service

Brandis then made further proposals in the matter of forest education, in order (1) to provide facilities to serving officers of the Forest Department (who had not received any scientific training in forestry) to be given suitable training and (2) to select and train in Europe five forest probationers immediately He also put forward a general scheme for the regular recruitment and training of young men in Europe for absorption permanently into the forest departments of India These suggestions were accepted both by the Government of India and the Secretary of State and in 1867 itself Brandis made contacts with French and German authorities for instruction of Indian Forest Officers on furlough

The initial arrangements for recruitment were of a wholly *ad hoc* nature Brandis's own remarks are quoted "The forest appointments for the minor administrations are in the nature of gifts of the Governor-General, or the Governors of Bombay and Madras for their Presidencies" Under these circumstances, anything like a competitive procedure for selection of the best available persons was naturally out of the question Therefore, Brandis successfully submitted detailed proposals for regular, annual and continuous recruitment and training of men for India's Forest Service The following categories of controlling staff were recognised. (1) Conservator, (2) Deputy Conservator and (3) Assistant Conservator All promotions from grade to grade within each category were left to the discretion of the local government, but promotions from Assistant to Deputy Conservator and Deputy Conservator to Conservator were to be made by the Government of India The following were the grades adopted:—

Conservators—

One post of Class I Conservator on Rs 1,600 per month

Two posts of Class II Conservators on Rs 1,400 per month

Two posts of Class III Conservators on Rs 1,200 per month

Three posts of Class IV Conservators on Rs 1,000 per month

Deputy Conservators—

First grade at Rs 900 per month

Second grade at Rs 700 per month

Third grade at Rs 500 per month

The number of Conservators was fixed at one for each Province, and the number of Deputy Conservators was decided at 14 for the whole country but with provision for expansion

Assistant Conservators—

First Grade at Rs 450 per mensem

Second Grade at Rs 350 per mensem.

Third Grade at Rs 250 per mensem

It was also stated that the young men would ordinarily enter the department at the lowest grade of Assistant Conservator and be promoted

to the next higher grade on passing the language examination and attaining a standard of proficiency Their promotion to Grade I was to take place ordinarily after three years of approved service in the next lower grade

Up to 1870 no trained officers were available, however, and appointments were largely by selection from other branches of public services such as the Army, the P W D and the Survey Department With the advent of a regular and separate Forest Department, a large number of permanent officers was required The army again provided a considerable number of recruits for such permanent appointments Their selection was on the grounds of aptitude for forest work They were usually ardent sportsmen or keen naturalists

By 1870, the Presidencies and Provinces were each in charge of a Conservator of Forests, with a number of officers who were in actual charge of districts With the increase of work and responsibilities, increased staff was necessitated

Executive Staff

Subordinate staff was difficult to recruit and this service was accordingly the slowest to develop and even by 1900 it remained most backward The bulk of the field staff in the early stages consisted of Forest Guards who possessed neither education nor technical attainments of any kind Recruitment to the ranks of Forest Rangers from amongst the Forest Guards thus proved exceedingly difficult In fact, in the beginning, the engagement of Forest Rangers was left entirely to the discretion of the local Divisional Forest Officers or the Conservators. There was no regular staff organisation or graded lists The men were appointed as and when required and had no particular prospects to look forward to, either The first improvement in this respect took place with the establishment of a Forest School at Dehra Dun in 1878, for giving training in forestry to men selected for appointment as Forest Rangers Two classes of Forest Rangers were provided for, with the following grades —

Forest Rangers—1st Class or Sub-Assistant Conservator of Forests
- 1st Grade Rs 200
- 2nd Grade Rs 150
- 3rd Grade Rs 120

Forest Rangers—2nd Class
- 1st Grade Rs 100
- 2nd Grade Rs 80.
- 3rd Grade Rs. 70
- 4th Grade Rs 60
- 5th Grade Rs 50

At the same time, all protective staff, consisting of all employees drawing pay between Rs. 50 and Rs 12 per mensem were called Foresters Those drawing less than Rs 12 were called Fire Watchers or Patrols and, subsequently, Forest Guards

In 1900 the staff of the Forest Department of India stood as follows—

Imperial Service—	
Inspector-General	1
Conservators	19
Deputy Conservators	117
Assistant Conservators	63
Provincial Service—	
Extra Deputy Conservators	5
Extra Assistant Conservators	107
Executive and Subordinate Service—	
Rangers	437
Deputy Rangers and Foresters	1,226
Forest Guards	8,523

At the beginning of the present century, the forests of India thus provided regular employment for a total of 10,508 forest personnel

Except for short interruptions (such as during the war between the Russians and the French), personnel for the Imperial Forest Service continued to be trained in France and Germany Ribbentrop has referred to Hill, Gamble, Wright and Tansley among those trained in France and Popert and Bonham-carter from the German school, as deserving of special mention Difficulties arose, however, in these training arrangements and after three years of discussion it was decided to provide for all future trainees at Coopers' Hill in England The first set of men joined Coopers' Hill in 1885 Schlich was chosen the first Professor of Forestry at Coopers' Hill Stebbing and W K Fischer were among the first probationers to come out of the school

Selection of probationers for training at Coopers' Hill was on the basis of a competitive examination held annually by the Civil Service Commissioners Forestry training continued at Coopers' Hill for twenty years and was closed down in 1905, when arrangements were made for training of forest probationers at Oxford or

Edinburgh In 1924, the opinion found favour that training of Indians recruited in India for the Indian Forest Service should also be carried out in India itself The Forest Research Institute, Dehra Dun, was decided as the training centre and from October 1926 onwards Indians for the Service were trained in India However, due to world conditions of economic depression, recruitment to the Indian Forest Service itself ceased with the year 1932

The first graded list of Conservators, Deputy Conservators and Assistant Conservators under the Government of India was published in 1869 In 1878, the North-West Provinces and Oudh were formed into three circles each under a Conservator of Forests The Department was reorganised in 1882 on increased scales of pay as recommended by Schlich, then officiating Inspector-General of Forests Only three grades of Conservators were maintained, the number of grades of Deputy Conservators of Forests was increased to four and that of Assistant Conservator of Forests remained at three as earlier

The service was again reorganised in 1891, with further upward revision of pay for the different grades It was then decided to fill only 80 per cent of the required strength by direct recruitment to the Indian Forest Service The balance 20 per cent was set apart to be filled by promotion from the executive staff (trained at Dehra Dun) of such persons as had rendered meritorious services the promoted staff was to be designated as Extra-Deputy Conservators, on pay ranging from Rs 350 to Rs 600

From 1920 onwards, as a consequence of the recommendations of the Islington Commission, further changes took place in the constitution of the highest service in the Forest Departments of India In 1920, it was decided that further recruitment to the Imperial Forest Service would be made (a) by direct recruitment in England and in India and (b) by promotion from the provincial service in India This marked the beginning of the regular admission of Indians to the highest ranks of the forest services in India The service also came to be referred to as the "Indian Forest Service" instead of the "Imperial Forest Service" Twelve per cent of the Indian Forest Service was to be filled by promotion from the Provincial Forest Service, in addition to those who were already Extra-Deputy Conservators of Forests The latter were also to be promoted to the Indian Forest Service automatically, if qualified Of the direct recruits, 40 per cent were to be Indians In fact, from 1921 onwards, 25 per cent to 40 per cent of the direct recruits were Indians, the actual numbers in any year depending on the availability of suitable Indians In 1923 only 12 per cent of the vacancies could be filled by Indians!

The Inspector-General of Forests

From its inception, the post of Inspector-General of Forests has always been held by an Indian Forest Service Officer, but the last officer of this Service will be retiring in the very near future In the days of Brandis, Schlich and Ribbentrop (i e from its inception in 1861 to the end of the nineteenth century), it was an important post, exercising administrative jurisdiction over all the forests of the Indian Empire including Burma Its position progressively became almost titular, with 'Forests vesting entirely in the Governments of the Provinces and with Chief Conservators of Forests taking over as heads of their Forest Departments In the late twenties, the Inspector-General of Forests had to take over the duties of the President, Forest Research Institute and Colleges also, as the post by itself was otherwise considered not necessary whole-time In the thirties, its very continuance was threatened more than once, such a post for the whole of India being considered no longer necessary However, by 1946, the position crystallised again, when the requirements of post-war reconstruction of India's forests on the one hand necessitated the guidance of a whole-time Inspector-General of Forests at Government of India headquarters, and the expansion programme of the Forest Research Institute and Colleges demanded the attention of a whole-time President In other words, from 1946, the functions of the post became clearly those of an adviser to the Government of India

But with India gaining her Independence in 1947 and launching soon after on a succession of development plans, the Inspector-General of Forests has still a significant part to play in the improvement of India's forests Again, with the World Forestry Congress, the British Empire Forestry Conference and more specifically the Forestry Division of the Food and Agriculture Organization, all helping in recent years to foster international interest in Forestry, the co-ordination of India's participation in regional or international forestry activities has naturally devolved on the Inspector-General of Forests as the obvious representative of India as a whole

In fact, the work of the post has increased to such an extent since the post-war years that a post of Deputy Inspector-General (with the rank of Conservator of Forests) has been in existence since 1945, and more recently (from 1960), an Assistant Inspector-General of Forests (rank of Deputy Conservator) also works at the headquarters of the Government of India

The Chief Conservator of Forests

In the history of the Indian Forest Service, Chief Conservators of Forests came to be appointed in the larger Provinces, only at a much later stage The necessity arose from the difficulty experienced by the Inspector-General of Forests to give his attention equally to all the fast developing forest units flung far and wide over the Indian Empire including Burma Consequently, in 1905, the Government of India suggested to local Governments to create posts of Chief Conservators of Forests in all Provinces where there were three or more Conservators The suggestion was first adopted in Burma, then in the Central Provinces and in Bombay Others followed later, till by 1918 every Province (with more than three Conservators) had appointed a Chief Conservator in charge of its Forest Department

The Chief Conservator of Forests became officially the head of the Provincial Forest Department and the technical adviser to the local Government in forest matters He was empowered to deal on his own authority with professional questions Powers were delegated to him to deal also with all technical matters, which Conservators were previously referring to the Inspector-General of Forests It was emphasised however that his duties as principal forest adviser to the Provincial Government should not interfere unduly with his duties, (especially of touring and field inspections) as head of his Department The Chief Conservator was also required to supervise all work regarding the compilation and sanction of forest working plans He had to secure uniformity of policy and exercise control throughout the Province as regards methods of silvicultural improvements, sales of produce, supplies against indents such as from Railway and Ordnance Departments, staff requirements in the forest department and the conduct of forest research and training of staff in communication with the President of the Forest Research Institute and Colleges at Dehra Dun

In other words, the post of Chief Conservator of Forests in each Province came to correspond with that of the Inspector-General of Forests for India and the latter began to concern himself more and more with the centralised subjects of Forest Education and Forest Research besides being always available for advising any Provincial administration that invited him to do so

Once they were created, the posts of Chief Conservators of Forests faced no vicissitudes, their functions as administrative heads of their departments and as forest advisers to their Governments being specifically understood In fact, all the changes that have taken place from time to time in the political framework of the Indian Empire have only strengthened the numbers and standing of Chief Conservators of Forests in the States Punjab, United Provinces, Central Provinces, Bombay and Madras appointed their own Chief Conservators of Forests, all before 1920 More recently the States of Bihar, Andhra and Assam have also appointed their Chief Conservators The latest post of Chief Conservator of Forests came into being in 1960 in the newly formed (out of the old Bombay State) Gujarat State

Conservator of Forests

As has been made clear, from the earliest days of scientific forestry in India, the post of Conservator of Forests was the primary administrative unit By 1870 a Conservator had many officers under him in the districts but he had himself to carry out executive jobs also With the formation of forest divisions, executive duties devolved progressively on the Divisional Forest Officers, leaving Conservators free for administrative and supervisory work

Prior to the creation of the posts of Chief Conservators of Forests, the Conservators dealt direct with the Inspector-General of Forests and the local Government, they had generally complete control of forest matters in their own Circles On all subjects having a bearing on the public of the district, they had to correspond with the Divisional Forest Officer through the Collector and *vice versa* and the Divisional Forest Officers were subordinate to the Collector in such matters Conservators were the controlling authorities in matters of subordinate services and departmental discipline On all subjects of a purely departmental or professional nature, the Divisional Forest Officers were directly responsible to the Conservators

When visiting the districts, the Conservator was expected to confer with the District Magistrate or Collectors and the Commissioners on

matters connected with his departmental inspections, in order to learn their views and to bring to their notice any matters which were important His touring and inspection duties involved, among other things, attention to surveys and settlements, working plans, forest boundaries, communications and building, staff condition, protection of forests, works of regeneration and tending and timber depots He had to ensure the adequacy and progress of aforesaid subjects and it necessary to report to the Government or the Chief Conservator of Forests about them He was also responsible for enforcing sound financial regulations in the various offices under him, ensuring that the officers and staff under him were conversant with their duties, maintaining discipline and supervising the progress of various works in the forests

Subsequently, in most Provinces, the authority of the Conservator of Forests was completely subordinated to that of the Chief Conservator of Forests in all matters After India's Independence, the Conservator has been called upon to look after all work of development of forests besides his normal duties connected with forest conservation In some States, the Conservator had also to see that privately owned forests were managed according to the provisions of the relevant Acts

The 'Conservator of Forests' has been perhaps the most stable designation in the Forestry of India The circumstances (of excessive and unregulated forest fellings) under which it was brought into use first as long ago as 1805, fully explain the emphasis on the conservation aspect of forestry as of prime concern to the Conservator Even to-day, in many parts of India, especially where the impact of large local populations on the forests is a major factor in regulating forestry methods, this forest administrator's first responsibility remains the protection and conservation of the forests in his charge With India's Independence and the subsequent rapid development in all fields of activity, the demands on forests were consistently on the increase, not only for their produce but for the very land on which they stand (for other uses) The continued maintenance intact of the integrity of the forest tracts became the anxious care of the Conservators of Forests The average Conservator's Circle included 5 to 6 Forest Divisions (and this has scarcely varied in the history of Forestry in India) In more recent years, special posts of Conservators have been set up to assist the Chief Conservator of Forests in the supervision of Working Plan preparation and control, in implementing and progressing special Development Plans and other such special works In every large or progressive Forest State, there is a Working Plan Conservator to-day The latest special but whole-time function, for which a Conservator has been set apart in a State or two, is the care of Wild Life

Deputy Conservator of Forests

A Deputy Conservator of Forests or Extra-Deputy Conservator of Forests usually held charge of a division and was called Divisional Forest Officer but it was not infrequently that an Assistant Conservator of Forests or an Extra-Assistant Conservator of Forests worked as a Divisional Forest Officer However, from the very earliest times of the setting up of posts of Divisional Forest Officer, their duties were clearly and almost finally defined The Divisional Forest Officer was the immediate controlling and executive officer of the division concerned All the works of sale, exploitation, regeneration, tending, protection, buildings, roads and bridges were to be undertaken according to his direction and under his personal supervision He was responsible for budgetary and accounts control over all revenues from the Division and expenditure on staff, works, etc The Forest Division in India became the unit of management from the very beginning and a Working Plan usually covered all the forests of a Division The Divisional Forest Officer was fully entrusted with the day-to-day management of the forests in his Division and had complete powers of control over all the staff in the Division As mentioned earlier, he was in most States subordinate to the Collector or other senior-most revenue authority in the district in such matters as affected the public of the district and to the Conservator in all other matters This position continues even to-day

Duties of Assistant Conservator of Forests

Ordinarily he was a young officer allotted to assist the Divisional Forest Officer, particularly in field work and inspection and to learn the management of a division He was generally attached to a division and took charge now and again in temporary and officiating vacancies On first appointment, for a year or two, the young Assistant Conservator of Forests had to be in charge of Ranges in order to gain full working knowledge of Range work.

It is needless to add that all Assistant Conservators, Deputy Conservators of Forests, Conservators and Chief Conservators and the Inspector-General of Forests were men belonging to the Indian Forest Service, until the end of the First World War or till about 1920 Officers promoted or directly recruited for work in the Forest Departments were designated Extra-Assistant and Extra-Deputy Conservators of Forests But subsequent to 1920, when promotions were also allowed into the Indian Forest Service besides the liberal admission of Indians direct to that Service, 'Extra-Deputy Conservators of Forests' were abolished In the earlier decades of Forestry in India, Deputy and Assistant Conservators were concerned mostly with the routine administration and management of the forests in the territories committed to their charge besides demarcation of forest areas But since the beginning of this century, specialisation was found necessary First, silvicultural research called for attention, then followed whole-time Working Plan Officers, Forest Utilization Officers and in very recent years Wild Life Officers The diversification of responsibilities and specialisation of duties have thus become a feature of forestry in modern times in India as everywhere else in the world

The Indian Forest Service

A total of 580 officers were selected between 1865 and 1930 Recruitment during this period was more or less continuous, except that there was no recruitment in 1867, 1868 and 1870 in the early formative stages and 1916 to 1918, the latter years of the First World War The annual recruitment was at an average rate of 7 to 10 until 1915, but in the post-war period the requirements of affording suitable employment to ex-military personnel combined with the Government's response to the demands for Indianisation, resulted in an unbalanced and heavy annual recruitment for the few years from 1921 to 1925, when as many as 178 officers were recruited in five years, the actual numbers being 62 in two batches in 1921, 30 in two batches in 1922, 46 in four batches in 1923, 25 in three batches in 1924 and 15 in 1925 With the constitution of Burma into a separate country, the active strength of the Indian Forest Service was noticeably reduced (by the entire Burma complement) Subsequent recruitment naturally dwindled down to very small numbers The world-wide economic depression that characterised the early thirties assisted in the Governments in India and the Secretary of State deciding on the final stoppage of all recruitment to the Indian Forest Service The last two recruits were selected in 1930 and entered the service in 1932

In 1935, the general list of Conservators and Chief Conservators was given up and the transfer of administrative personnel from one Province to another on the basis of that list also ceased to be Except for deputations to the few posts under the Government of India, Indian Forest Service officers had to look for all prospects within the restricted provincial cadres themselves, however, the Secretary of State protected their interests in respect of financial loss by introducing a system of payment of compensation But that also came to an end with the withdrawal of the British from India in 1947

As with every other all-India Service, the Indian Forest Service also suffered a great depletion not merely in numbers but in the number of its experienced and senior personnel as a result of this withdrawal On the eve of Independence as many as 42 British Officers of the Service quit it, availing themselves of the compensation terms offered, and five more who had stayed on also retired subsequently without completing their full term of service The last British Inspector-General of Forests (Hamilton) left India in May 1949 At the same time, with the partition of India, some ten Indian Forest Service officers went over to Pakistan While all this sudden and heavy exodus of more than a third of the Service and that too all senior men (mostly recruited 20—25 years earlier) meant unexpected advancement in career to many of their Indian colleagues, it also resulted in the latter having to shoulder heavy responsibilities, especially because of the lacunae in the succession to lower posts in the officer ranks caused by the short-sighted stoppage of all recruitment during the depression years from 1930 to 1940 and even later

In 1950, India declared herself a Republic and the States (previously provinces) became wholly autonomous, and with that, the last vestiges of an all-India character of the Service came to an end in practice, though the few individual members still in service continued (at least nominally) to benefit by the guarantees given by the Government of India at the time of Independence in respect of conditions of service, especially of salaries, leave and pension The last of them (Bhadran) is due to retire in 1962, almost exactly a hundred years after Brandis was officially brought on the All-India scene in 1861 to organise the forests of India.

The Indian Forest Engineering Service

Reference may be made here to a short-lived adjunct to the Indian Forest Service The Indian Forest Engineering Service was inaugurated as a post-war innovation in 1921 Eighteen men were recruited to this service in 1921-22, mainly to develop the essential requirements for improved forest utilisation, such as roads, tramways, ropeways, saw-mills, etc Half the number was allotted to Burma, two each to the Punjab and Bombay and one each to Bengal, United Provinces North-West Frontier Province, Bihar and Orissa and Coorg The service ceased to be by 1935, by which time ten of the members had died in service or retired prematurely The rest were absorbed either into the Indian Forest Service or the Indian Service of Engineers

The Indian Forest Service and the Forest Research Institute and Colleges

Reference may also be made here to the staffing of the forest research and education centre at Dehra Dun While the Forest School for training Rangers for all parts of India began in 1882 under the guidance of Indian Forest Service officers, the Forest Research Institute itself took shape only in 1906, when also all its five branches of study were headed by officers of the Indian Forest Service In fact, the Forest Research Institute and Colleges were rightly dominated by forest officers on deputation, particularly officers of the Indian Forest Service, right up to the date of India's Independence But now only one officer of the Indian Forest Service occupies a regular post in the Forest Research Institute and Colleges, that of the President The increasing calls on the average Forest Officer's time because of enlarged administrative work, the shortage of personnel in India's Forest Departments and the vastly increased needs for trained men to implement their development plans, all combined progressively to restrict the participation of forest officers to work in the colleges and the silviculture branch only

Some Outstanding Men of the Past

While almost every member of the Indian Forest Service has undoubtedly given of his best to the cause of India's forests and scientific forestry, it will be but appropriate here to pay tribute to some outstanding personalities The valuable work done by the early pioneers in different parts of the country—like Conolly in Madras, Gibson in Bombay Cleghorn in Madras and Punjab, Anderson and Gustaff Mann in Bengal and the Eastern Provinces and India—enabled Brandis to give the Indian Forest Service an excellent start, Brandis, Schlich and Ribbentrop between themselves dominated India's organised forest administration for nearly 40 years It should be no wonder then that in the hundred years that the service has been in force, many of its members have distinguished themselves in forest administration, but what is of even greater significance is the individual contributions of quite a number of Indian Forest Service officers to the advancement of the science of forestry in various technical fields such as Silviculture, Botany, Entomology, Utilisation and Forest Education The good work of many officers of the Indian Forest Service was recognised by the award of Knighthood and other titles by the British Crown

Administrators

Among outstanding administrators must first come *Dietrich Brandis* In fact, he was most versatile Besides organising India's forests and setting up its administrative machinery, he was personally responsible for quite a few working plans dealing with the tracts concerned for the first time His comprehensive work 'Indian Trees' marks him out as no mean Botanist too In May 1883, the Governor-General placed on public record the eminent service rendered by Brandis.

When Brandis entered service the revenues of the Forest Department of the Indian Empire were some Rs 35 lakhs and when he retired they had risen to Rs 95 lakhs The foundations so well laid have been truly built upon by succeeding generations of Forest Officers and India's Forest Revenues to-day (but excluding Burma and Pakistan) are of the order of Rs 5,000 lakhs

Among other outstanding administrators (most of whom rose to be Inspector-General or Chief Conservator of Forests) that the Indian Forest Service produced, may be mentioned the following —

W Schlich (1866-89) joined the Indian Forest Service (at the age of twenty-seven) in Burma and served in Sind and Bengal also To Schlich must accrue great credit for (i) reorganising the controlling staff to relieve serious blocks in promotion, (ii) forming an Internal Working Plan branch, (iii) revising (Third Edition) of the Indian Forest Code and (iv) organising the Forest School at Dehra Dun Schlich concluded his career in India in 1885, when he vacated the post of Inspector-General of Forests and returned to England to organise the new Forestry School at Coopers' Hill It was there that his best contribution to Indian Forestry followed, when many recruits to the Indian Forest Service passed through his hands He was associated with teaching Forestry almost right to the end of his life in 1925. His

monumental work 'Manual of Forestry' in five volumes remains a classic in its field

B Ribbentrop joined the Indian Forest Service along with Schlich, but began his career in the Punjab He retired in 1900 after serving in India for thirty-four years During the last fifteen years of his service he held the post of Inspector-General of Forests During this period with great skill and judgment and with indefatigable energy he guided and superintended extensive and far-reaching changes in the organisation of the Forest Department, particularly in building up the Provincial Forest Service

S E Wilmot (1873-1908) was responsible for



the founding of the Forest Research Institute at Dehra Dun in 1906, which has since grown from strength to strength.

Of *E Fernandez* (1881-1902), it may be confidently said that few men have contributed so much to building up a scientifically equipped forest personnel He was particularly responsible for the development of the forest school at Dehra Dun He was also author of many working plans, especially of the first plan for the Dehra Dun Forests (1888-1902)

T R D Bell (1884-1920) did great service to stabilise forests working in Bombay Presidency and had the satisfaction of being appointed its first Chief Conservator of Forests

P H Clutterbuck (1889-1926) served in the Central Provinces and the North-West Provinces before being appointed the first Chief Conservator in the United Provinces (1915—28) He retired as Inspector-General of Forests He was responsible for installing the first major forest industry in the United Provinces, the Indian Turpentine and Rosin Factory near Bareilly The Industrial township which developed as a result came to be known as 'Clutterbuckganj' As Inspector-General of Forests he was largely responsible for the subsequent enlargement of the Forest Research Institute at Dehra Dun to its present vast dimensions He retired in 1926 from the Indian Forest Service only to join the Jammu and Kashmir State, where he became Development Minister in 1942 He re-organised the valuable forests of Kashmir and brought them under scientific management He was responsible for setting up forest industries in the State Apart from Brandis, his was the most colourful, varied and purposeful career in the Indian Forest Service

W F Perree first joined in Bengal in 1893 but he gave of his best to Assam His Working Plan for the Goalpara forests was the first ma-



jor working plan for sal forests in India His division of the solid block of 100 sq miles of submontane forests by cutting permanent side and parallel lines a mile apart resulted in these forests becoming accessible

C G Trevor (born on 28-12-1882) was connected with India from birth, as his father was then Principal Medical Officer of Her Majesty's Forces in India and Colonel Commandant R A M C He joined the Indian Forest Service in the Punjab in 1903 His contributions to work on

the natural regeneration of deodar, spruce and silver fir were oustanding His working plan for the Kulu forests for the period 1919-20 to 1939-40 was "a great advance on any similar production which has yet been issued for the coniferous forests in the Himalayas". In 1926, he was appointed Vice-President of the Forest Research Institute and the Professor of Forestry for the newly started course of training for the Indian Forest Service at Dehra Dun In 1933 he became Inspector-General of Forests and President, Forest Research Institute He represented India in the Empire Forestry Conference in Canada (1923), Australia (1928) and South Africa (1935) His post-retirement activities included management of his own woodland in England of some 1940 acres, for which he made his own plan of operations and maintained careful records till his death in 1959.

E O Shebbeare was another versatile officer of rare ability He joined the service in 1906 and served in Bengal, Central Provinces and United Provinces before he retired in 1938 He was responsible for the bold adoption of clear felling and taungya method of regeneration on a working plan scale in North Bengal He is also a great naturalist, being equally as conversant with field botany as with wild life, his special study in the latter covering birds and snakes But his love of Nature found full expression when he joined an Everest expedition at an age when any average individual would have considered himself too elderly for the arduous task

E A Smythies joined the United Provinces in 1908 where he worked in every variety of terrain and forest He was the first Silviculturist (1918) of the United Provinces He was Working Plans Conservator of Forests for long periods and retired in 1940 as Chief Conservator of Forests His book (jointly with Trevor) on 'Forest Management' was a valuable addition to the Forestry literature of India even as his safe-guarding formula for yield regulation proved valuable in conserving the mature crops in sal forests, while the problems of their regeneration were being tackled

A J W. Milroy was an outstanding figure in Assam's forestry He joined the Indian Forest Service in 1908 and died in service in 1936 His collaboration with Shebbeare in enthusing a number of workers in tackling the problems of natural regeneration of sal in the moister forests was a fine example of team work He was a pioneer in the field of Wild Life Conservation and was responsible almost personally from saving the great Indian Rhinoceros in Assam from extinction His administration was marked by much tolerance and yet efficiency

L Mason (1910-1941) served in the Punjab, United Provinces and Central Provinces before he became Inspector-General of Forests, which post he vacated on the out-break of World War II in order to organise timber supplies from India as a war effort, which he did with conspicuous distinction.

S H Howard joined the Indian Forest Service in 1911 Besides working in various capacities in the United Provinces, he worked with great distinction as Central Silviculturist (1919-26) and also held additional charge of the post of Forest Botanist He prepared an impressive working plan for Haldwani Division and raised some of the finest plantations in that division He retired as Inspector-General of Forests in 1945

Forestry in India is indebted to Sir Herbert Howard for contributions which vary from propaganda leaflets to statistical tables of yield and volume He introduced a system of ledger filing for the maintenance of technical records in the Forest Research Institute He compiled a Forest Pocket Book which has gone through five editions His lucid enunciation of a Post-War Forest Policy for India (1944) gave a new orientation to Forestry in India

C E. Simmons (1913--1946) served most of the time in Assam He was an outstanding Instructor at the Forest Colleges at Dehra Dun and as-



sisted Trevor in the initial organisation of training for the Indian Forest Service officers in India (1926) He returned to the Forest Research Institute in 1944, when he became its President after retirement During the short spell before his final retirement in 1946, he was responsible for the large-scale re-organisation of that Institute to equip it to play its due role in the rapidly developing economy of India

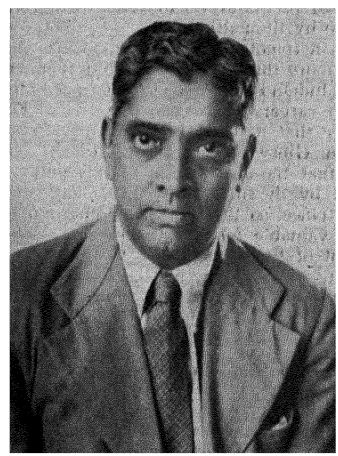
M D Chaturvedi (1922-54) was India's first Indian Inspector-General of Forests He distinguished himself by his contributions to Working Plans and Silvicultural studies in Uttar Pradesh, culminating in his compilation on 'Land Management' which laid down a programme for rural forest development in that State Whatever place 'Forestry' has been accorded in the country's current Five-Year Development Plans is due to Chaturvedi's foresight and drive Credit must go to him too for the slogan of 'Vana Mahotsava' and also for propaganda for wild life A new National Forest Policy for India was also evolved under his guidance, in replacement of the Policy of 1894 which served the country well for many decades but needed re-orientation in the altered political and economic conditions following Independence He was the Secretary-General for the Fourth World Forestry Congress at Dehra Dun, 1954

Chaturvedi continues to serve the cause of forestry in other lands, even after retirement from India, working as a Forestry Expert under the Food and Agriculture Organization of the United Nations

C R Ranganathan (1923-1956) made outstanding contributions to Working Plans work and to Rangers training He was the first Indian President of the Forest Research Institute and Colleges, Dehra Dun He was almost the best ambassador ever for Indian Forestry He attended three World Forest Congresses and presided over its Dehra Dun meetings (1954) He visited the USSR as the forestry member of a study team besides attending various meetings of the Food and Agriculture Organisation and its Asia-Pacific Forestry Commission

A number of officers of the Indian Forest Service brought their administrative abilities to bear on improved forest management in areas outside the jurisdiction of the Service To quote Troup (Colonial Forest Administration, 1940), "In forest matters the (British) Colonies may well be regarded as the disciples of India. On various occasions officers of the Indian Forest Service have visited Colonial Dependencies and given advice on forest administration Some have joined Colonial Forest Departments in senior positions and have placed their experience at the disposal of the countries concerned, and former officers of the Indian Service have been responsible for the training of a large proportion of the officers now serving in the Colonial Forest Service" It may be added that the large scale exodus from the Indian Forest Service in 1947 enabled not only the Colonial Forest Department but the British Forestry Commission itself to secure the services of such experienced men

Apart from helping in scientific forest development outside the Indian Empire, many officers of the Forest Service distinguished themselves in organising sound administration and establishing good forest traditions in the Princely States of India, to which they were deputed or by which they were employed For instance the State of Jammu and Kashmir was able to develop its valuable forest estate almost on as efficient lines as the British Indian Provinces, mainly because of the succession of Indian Forest Service officers (on loan) who were at the head of the State Forest Service from 1891 onwards While *G C Macdonnel* (1891-1904) initiated the



C R. Ranganathan

Forest Department, *H L Wright* (1923—1933) introduced a Forest Code for the State It was Sir Peter Clutterbuck (as stated elsewhere) who organised Kashmir's forests and forest administration on modern lines, taking up service with the State after retirement from the Indian Service *H F Mooney* distinguished himself as Forest Adviser in the Eastern States Agency *S A Wahid* helped Hyderabad State (as its Inspector-General—on loan from the Central Provinces in 1942-47) to rectify its defective forest rules and regulations, give its forest management a new, scientific orientation and bring its forest administration on par with that in the rest of India

Numerous Officers of the I F S distinguished themselves in the fields of silviculture, forest botany, forest entomology, forest economics, and forest education Brief particulars of some of them may be found in the appropriate sections.

Thus the achievements of the Indian Forest Service in the first century of scientific forestry in India, collectively and individually, have been of a very high order, in spite of the very arduous nature of the work involved and the comparatively small recognition that came their way How arduous and exacting it was can be best gauged from the unvarnished fact that of the 580 men who joined this Service, 78 died in service (five killed in action in World War I) and 92 resigned or retired prematurely, most of them compelled to do so by ill-health contracted in the course of service in remote and unhealthy tracts In other words, more than one in every four men who joined the Indian Forest Service sacrificed their lives on their careers to the cause of Indian Forestry, in order that it may grow from strength to strength Glory be to these martyrs It is to be hoped that the significance of this will be fully realised by the successors to the Indian Forest Service in office so that they may guard the better India's valuable forest estate And, let the Government of India from time to time also appreciate this, so that they may at least pause before dealing with this rich heritage except in the best and permanent interest of the country

The Provincial and State Forest Services

From the very early days of Conolly and Chathu Menon and their memorable efforts at teak planting in Nilambur, the assistance of locally recruited sub-officers working under the European Divisional Forest Officers was a feature of forest management and administration in India As a regular service, the Provincial Forest Service was first inaugurated in 1891 Even earlier the increase of field work had necessitated the employment of a larger number of officers than those borne on the regular Indian Forest Service cadre Young men, mostly Eurasians or Anglo-Indians, trained in the Rangers' School were recruited as Sub-Assistant Conservators of Forests Previous to 1891, the salaries of Sub-Assistant Conservators of Forests ranged between Rs 175/- and Rs 250/- only and their strength for the whole of India was 47 In 1881-82 it was proposed to fill the posts of Sub-Assistant Conservators of Forests as far as possible only with local recruits but this proposal was not seriously implemented even till the turn of the century, as according to Ribbentrop (1899) "it was a source of patronage by the local Government and sowed seeds of discord as those Europeans or Anglo-Indians were by no means superior to the Indian Rangers with whom they passed out from the Rangers School".

Therefore, the recruitment of Sub-Assistant Conservators of Forests was stopped and in 1891-92 a Provincial Forest Service on a common basis for the whole of India was sanctioned in the scale of Rs 200—350, and "was kept as a prize for the able and the meritorious from among the Rangers who could be promoted to this class" These officers were known as "Extra Assistant Conservators of Forests" Only the following were eligible for promotion as Extra Assistant Conservators of Forests (a) Forest Rangers (Higher Standard with honours) with not less than two years satisfactory service as Forest Ranger, (b) Forest Rangers (Higher Standard without honours) with not less than five years' satisfactory service as Ranger, (c) Forest Rangers who were in service before 1881, possessing good general education and sufficient knowledge of English having not less than five years service as Forest Ranger Extra Assistant Conservators of Forests with more than five years satisfactory service were promoted to the rank of Extra Deputy Conservators of Forests

The reorganisation of 1891 gave the following pay scales for various ranks - -

Provincial Service Officers

Extra Deputy Conservators--

1st Grade Rs 600/-

2nd Grade Rs 550/-

3rd Grade Rs 500/-
4th Grade Rs 450/-
Extra Assistant Conservators of Forests—
1st Grade Rs 350/-
2nd Grade Rs 300/-
3rd Grade Rs 250/-
4th Grade Rs 200/-

These scales have been revised subsequently resulting in the abolition of grades and their substitution by a time scale and further in considerable increases in the scales themselves The Extra Deputy Conservators of Forests were treated as belonging to a superior cadre and were equated against 20 per cent of posts in the Imperial Forest Service

With the object of raising the standard of the Provincial Forest services a system of direct recruitment was introduced in 1905 The candidates chosen were either Rangers already in service or "young men of good education and social standing" Rangers were required to undergo the third year of the three-year Provincial Forest Service Course (as an extension to the two-year Ranger Course already completed by them), while the direct recruits took the full three years of the new course at Dehra Dun On the completion of this course of training and after three years' approved service as Ranger or as probationary Extra Assistant Conservator of Forests, the candidates became eligible for permanent appointment in the Provincial Forest Service In 1912, a separate two-year course was introduced for direct recruits in the time scale of pay of Rs 250/- to 850/- As a matter of fact, this resulted in considerable hardship and heart-burning in the "Ranger staff who formed the backbone of the staff of the District Forest Officer and the restriction to promote Rangers was withdrawn later"

In 1920, as a result of the orders passed on the recommendations of the Islington Commission, all Extra Deputy Conservators of Forests were declared fully equipped to hold major divisional charges and were transferred to the Indian Forest Service cadre Except for five officers who were left to retire as Extra Deputy Conservators of Forests all others had been so absorbed into the Indian Forest Service by 1923, when the class of Extra Assistant Conservators of Forests was finally abolished The Provincial Forest Service then consisted of Extra Deputy Conservators only but they were eligible for promotion to the Indian Forest Service to the extent of 12½ per cent of its cadre strength in the Province Such promotions were to be made by the local Government strictly on the grounds of merit The Extra Assistant Conservators of Forests represented for the removal of the word "EXTRA", but Government decided to retain the distinction between young officers of the Indian Forest Service and of the Provincial Forest Service

From 1st April 1921, recruitment to and employment in the Provincial Forest Service rested entirely with the local Governments, subject to the proviso that the maximum pay allowed by them should not exceed Rs 1,200/- p m With the inauguration of Indian Forest Service training in India in 1926, direct recruitment and training for the Provincial Forest Service was stopped There was no significant addition to the officer ranks of the Forest Departments of India between 1930 and 1940

Consequent on the introduction of Provincial autonomy in 1935, "Forest" became a provincial subject and even the staffing of their forest departments was left entirely to the Provincial Governments Only the training of the staff (prior to their joining service) continued at central institutions An Indian Forest College was opened in 1938 to train the first batch of the new Superior Service Officers Subsequent to 1947 the State Forest Services have come into existence The present members of the State Forest Service receive their training in the Indian Forest College, the first batch having passed out in 1940 A proportion of the posts is, however, filled by the promotion of suitable Forest Rangers

It is of interest to note that less than a century ago, direct recruitment of officers for the Forest Department of India was 7 to 10 annually, it was stepped up to an average of 40 or so just for a few years in the early twenties, this serious imbalance in recruitment resulted in the Government of the day finding it necessary to stop all recruitment for almost the whole decade in the thirties But the natural expansion of forest activity everywhere in the country along with the vast development programmes undertaken since 1951 have led to the enlargement of the State Forest Services on a considerable scale At present the average annual intake for all States together is about 60 officers directly recruited as Assistant Conservators This rate, it is expected, will be sustained, if not further augmented It will also be of interest that because of the big gap in recruitment all over the country from 1930 to 1940 and beyond, the officers of this later recruitment benefited by unusually rapid advancement in career, Most of them had to be

placed in charge of Forest Divisions directly after their training in the Indian Forest College, without much preliminary experience in the forests In turn, some of them became Conservators with less than ten years' service and even Chief Conservators when scarcely in their forties In fact, in 1961, officers of the State Forest Services (products of the Indian Forest College) are in charge of the forest departments in 12 out of the 15 States and the 3 major centrally administered areas of Himachal Pradesh, Andamans and the North-East Frontier Agency The first of them to be appointed Chief Conservator of Forests is G S Dhillon, who took charge of the Punjab Forest Department in 1957

Subordinate Services: Forest Rangers and other Forest Personnel

The subordinate staff was the slowest to develop in an organic manner and even up to 1900 it was quite backward In the beginning the appointment of all Range staff rested entirely in the hands of the District Forest Officer and the Conservator There was also no province- or region-wise organisation or gradation list, men being appointed as and when any need was felt, with no particular prospect in service The first step towards improvement was taken with the establishment of the Forest School in 1878, but even then prospects were very ill-defined The idea of Brandis that "District Forest Officers should train their subordinates", persisted for an unduly long period and the predecessors of subordinate services, viz, *Daroghas, Sarbalakaras, Chaprasies,* continued to serve as best they could Brandis was himself responsible however, for establishing the first cadres of Forest Rangers and Foresters and replacing *Chaprasies* and peons by Fire Watchers and Forest Patrols The term Deputy Ranger appeared for the first time in 1891 Also 'Forest Guard' replaced 'Fire Watchers' and 'Patrols' The forest school for training Forest Rangers was opened on 1st June 1879 at Dehra Dun and the first class passed out in 1881 Two separate sets of courses were given in the school, one in English for Rangers and the other in Vernacular for Foresters On 3rd June 1884 the school was taken over by the Government of India By 1900 some 360 Forest Rangers and 112 Foresters had passed out from this school In 1901, Brandis wrote "that men entering Dehra Dun Forest School belong to a lower social stratum than is desirable and this will continue until Forest Rangers are given reasonable prospects of promotion".

A general scheme for reorganisation of Executive and Subordinate staff was framed in 1887 but was dropped pending reorganisation of the Controlling Staff which finally took place in 1891 The reorganisation scheme of Executive and Subordinate services was finally sanctioned and adopted in 1896 and the pay scales were fixed as under —

Executive Staff

Rangers—
1st Grade Rs 150
2nd Grade Rs 125
3rd Grade Rs 100

Deputy Rangers—
1st Grade Rs 80
2nd Grade Rs 60
3rd Grade Rs 50

Subordinate Staff

Foresters in the graded scale of Rs 15, 20, 25, 30, 40

Forest Guards—Rs 6 to Rs 12

It was not long before the executive and subordinate services were constituted entirely on a Provincial (and more recently a State) basis The basic designations of Forest Rangers Deputy Rangers, Foresters and Forest Guards prevail all over the country, besides Forest Watchers and Fire Watchers in some States

The pay scales of subordinate staff have been revised several times and have been revised from grades to time-scales of pay also Naturally, each Province or State has adopted scales comparable to pay scales of similar staff in other departments of the State Government and consistent with the general economic conditions prevailing in the State As an example, the pay scales introduced in 1947 in Uttar Pradesh were as follows

Forest Rangers Rs 120—8—200—10—300
Deputy Rangers Rs 75—5—120
Foresters Rs 60—3—90—4—110
Forest Guards Rs 25—1—40

Really good Rangers could expect promotion to officer grades Forest Rangers are usually recruited, about 50 per cent by direct recruitment and training in the Forest Colleges at Dehra Dun or Coimbatore and the rest by promotion of Deputy Rangers and Foresters and occasionally ministerial staff in the forest offices Wherever the posts of Deputy Rangers existed, they were filled

almost entirely by promotion of Foresters Foresters were generally recruited direct or by promotion of Forest Guards

Duties Prescribed from Time to Time

From the very beginning Forest Rangers were intended to remain in charge of a Range and be responsible for all forest operations within the Range They have rightly been referred to repeatedly in the history of Indian Forestry as "the backbone of India's Forest Services" Sometimes Rangers were also required to perform special duties, such as in the working plans, silvicultural research and other fields The Forest Ranger was originally drawn from social and educational levels that scarcely permitted of his rising above that grade In the present century there has been steady improvement in this respect though even as recently as in the twenties, only very exceptionally were Rangers available who could be considered fit for further advancement But since then conditions changed rapidly and university graduates were attracted in larger numbers to this rank Consequently, in the last two or three decades, it has became quite common even to find Conservators in different States who had risen from the grade of Ranger and exceptionally, from even lower ranks Besides, the standard of scientific knowledge and technical efficiency increased considerably as a result of the widening of the circle of trained personnel In fact, well before the close of the first hundred years of Forestry in India, in every part of the country arrangements were in force for all forest personnel to be professionally trained either before admission into the department or at least shortly after

'Foresters' and 'Forest Guards' are categories of personnel found in all States of India They came into existence in the different Provinces and States, in accordance with the necessity for field assistance to the Rangers Particularly in the regions where forest protection became a problem Forest Guards were placed in charge of small units of areas known as Beats, often assisted in their patrolling work by temporary hands known variously as Forest Watchers, Fire Watchers, Patrols, etc

It would be but appropriate to recall here the names of some at least of the men, who distinguished themselves and rose from the ranks of Ranger or below to be Conservators of Forests or to be admitted to the Indian Forest Service,

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T N. Koppikar joined the Bombay Forest Department in 1893 and served till 1925 He was promoted to the Provincial Service in 1909 and to the Indian Forest Service in 1922, apparently in recognition of his excellent contribution to the classification and organisation of the forests of Bombay Presidency and their systematic management.

K R Venkataramana Iyer has left an indelible mark on the working and administration of the forests of the Madras Presidency, both in the field and in the office Madras owes him a deep debt of gratitude, particularly for the improvements he so meticulously effected in the various Codes and Rules

U N Kanjilal was a distinguished pioneer in the Forestry of Assam His compilation of the School Circle Flora is even to-day the first book of reference to which every forest trainee is introduced in India He also did most of the work on a Flora of Assam He was promoted as Extra Deputy Conservator of Forests before he retired

Keshava Nand secured the Ranger's Certificate with Honours in 1885 He was a true pioneer who "supplemented this training with much careful study" He was responsible for the preparation of working plans for many forest areas for the first time, especially in the Oudh areas About 1900 he went to the princely State of Tehri-Garhwal (which even to-day is a remote tract) as its Conservator of Forests He retired in 1929 from the United Provinces Forest Service as an Extra Deputy Conservator of Forests and died shortly after in the same year

G O Coombs joined the United Provinces Forest Department in 1898, was promoted to the Provincial Service in 1905 and to the Indian Forest Service in 1919 He retired in 1931.

M P Bhola was a Forest Ranger from 1902 to 1909, when he was promoted to the Provincial Forest Service He was admitted to the Indian Forest Service in 1920 and continued to serve the State till 1936, officiating as Conservator for a year or two He laid the foundations for the *'taungya'* method of regeneration in the United Provinces

P C Kanjilal, son of the illustrious father who served in Assam, passed the Rangers' Course with Honours in 1910 and was immediately after admitted to the third year course of the Provincial Forest Service course He was promoted to the Indian Forest Service in 1923 and remained in active service till 1940 Besides being in charge of regular as well as Working Plans divisions, he worked in a variety of other posts, as

Instructor in the Forest College (1917—22), as Provincial Silviculturist (1923) and Forest Botanist, Dehra Dun (1924) and was also on deputation to Assam for two years to help publish his father's monumental work on the flora of that Province

A. Das joined the Assam Forest Department as a Forester and rose to be admitted to the Indian Forest Service He contributed much to the local advancement of the sciences of Botany and Silviculture besides the teaching of Forestry After retiring from the Indian Forest Service, he went to Mayurbhanj to organise the forests of that State

Bahadur Singh distinguished himself in the Punjab by his classic work on the irrigated plantations of the Punjab, which have meant so much to the development of the Punjab.

To *C E Parkinson* goes the credit of having compiled a Flora of the Andamans He served also as Forest Botanist in the Forest Research Institute, Dehra Dun

M C Bonnington, originally of Burma, was Chief Forest Officer Andamans, for over 20 years from 1927 and did pioneer work in studying the forests and bird life of these islands

B S Chengapa identified himself completely with the Andamans forests, for which he compiled the first comprehensive Working Plan His outstanding contribution to forestry was the development of a procedure to obtain natural regeneration in the evergreen and deciduous forests of these islands He did pioneer work in leading an exploratory expedition to the Nicobar islands During the War emergency (1942—45) he rose to the occasion and assisted the Forest Research Institute in the Utilisation and Education branches

Thus credit for much of the outstanding work in the development of the remote Andamans islands forest must go to officers other than those directly recruited to the Indian Forest Service, though men like Martin, Foster and Banerji did much to administer these forests well

Quite a few other officers also made their mark in specialised fields of study, like *J N Sen Gupta* of Bengal, *Iswardas Mahendra, Permanand Suri* and *Prithvinath Deogun,* all of the Punjab, and *M S Raghavan* of Madras in Silvicultural Research, *Rajendranath De* of Assam in field silviculture, *Chandrasekhar Purkayastha* of Assam in Botany, *R B Cornwell* of Madras and Andamans, and *T K Mirchandani* of Bombay in Forest Engineering, *T V Venkateswara Iyer* of Madras in Working Plans, *V A N Sausman* of Bombay in Soil Conservation and *Sasi Mohan Deb* of Assam in Forest Utilisation

Thus it is that devoted bands of officers, British and Indian, and Rangers have toiled incessantly for a hundred years now, to build up a truly valuable forest estate in India The progress of forestry in these ten decades has been phenomenal from mere protection, passive conservation and incidental realisation of forest produce on a conservative sustained yield basis, Indian forestry is progressively moving forward to a dynamic policy of expansion, extensive planting and of forest production to meet the needs of the people The personnel (Indian Forest Service, Provincial Forest Service and others) that served India's forests so well in the first century of scientific forestry can ask for no better recognition than that their successors (in the State Forest Services) should carry on the good work and endeavour always to excel on past achievements

"On the roads wells have been dug and trees have been planted for the enjoyment of both man and beast"

—Ashoka Edicts



CHAPTER VII

SPECIAL FOREST DEVELOPMENT SINCE 1947

Status of Forests in 1947

Forests constitute an important feature of India's natural wealth, for forest produce is indispensable in peace and in war, for defence, communication and vital industries apart from serving the local needs Forests have to be managed chiefly in the interests of the region, if not the Nation as a whole It follows that their organization, protection and development must form a progressive function of the State Their management on scientific and business lines is essential for maintaining a sustained supply of wood and other products, from year to year in perpetuity At the same time, forest products are bulky and difficult to procure and transport over long distances or from other countries, especially in times of stress So, the National Forest Policy aims at the maximum development of the forest potential of the country, if not at attaining national self-sufficiency in respect of these vital supplies All developmental activity is always directed towards this end in view

Planning for development is nothing new to foresters Drawing up of regular working plans for the systematic management of forests was among the earliest of activities in the regular practice of forestry, almost from a century ago However, while every working plan prescribed for 'Special Works of development' to be undertaken, neither the prescriptions in this respect were obligatory nor were they on a significant scale It was unfortunate also that all along, expenditure on forestry and forest administration was limited to but a part of the revenues derived from the forests In fact, it was even the case that the measure of good administration of any forest tract was the net surplus over expenditure obtained in the year The result was that poorer forest areas suffered further and further owing to want of special efforts at rehabilitation and development The need for such special efforts began to be felt particularly after the destructive effects of the Second World War and its insatiable demands for timber During the war, the forests of India served the Government and the people well but not without serious inroads into and even denudation of the permanent growing stock This led to Howard's far-sighted post-war forest policy for India formulated in 1944 even before the war had actually come to a close Thus, while India's forests had been conservatively managed during the many decades since 1861 (except during the periods of the two World Wars), they were in need of special development on a very large scale, even as the rest of India's economy was This fact came forcibly to notice on the attainment of Independence in 1947 and the need for meeting national requirements in full from national resources was increasingly realised The post-war rehabilitation schemes were as a result, merged into an active development programme to be included in the National Five-Year Development Plans

Period Prior to India's First Five-Year Plan

The urge for country-wide development following on the dawn of Independence led to plans and schemes calling for the adoption of bolder measures and closer co-ordination than was found necessary in the previous regime The role of forestry in the economic development of the country and the protective functions of the forests came to be more vividly realised than before Measures were also adopted for the State to administer the forest areas of the former princely States on their integration with the Indian Union, besides steps to take over large private forests in ex-zamindari and other areas All this necessitated schemes for further forest reservation, at this rather late stage in India's forest history The degraded or denuded nature of most of these forest areas further demanded that they should receive special attention urgently Other productive schemes such as extension of valuable plantations for timber and fuel were also taken up A soil conservation unit was also set up to deal with the protection and management of important catchment areas and with the problem of soil erosion in general The Working Plan organizations, which were considerably reduced during the depression periods in the thirties and were even held in abeyance during the war period, were restored and enlarged as necessary In Uttar Pradesh, a Land Management Circle was created in 1945 for the creation of village fuel and fodder reserves, the proper management of road-side avenues and trees and

other amenity or ameliorative forestry work primarily in the non-forest districts of the State

During the post-war development period, attention was also paid to the enlargement of training facilities for Forest Officers and Rangers and to the provision of amenities for the staff and labour employed on forestry operations

It was during this period that the reconstitution of the Board of Forestry was also taken up The need for setting up a central forest organization to suit the altered conditions was voiced at a Conference of Forest Ministers of States held in 1948 As a result, the Central Board of Forestry was reconstituted to include Ministers, in the belief that its deliberations would inspire public confidence and meet with public response and country-wide support

During this transitional post-war period (from 1947—51), despite legislative measures, there was considerable destruction of tree growth, and it was considered necessary to enthuse the people in the cause of planting trees A tree planting festival calling for annual observance of a "Van Mahotsava" week was initiated from July 1950 through the efforts of the then Union Minister for Food and Agriculture, Sri K M Munshi, and the Inspector-General of Forests, Chaturvedi Since then Van Mahotsava has developed into an annual feature during which people are entrusted not only to plant trees but to care for them, not to treat Van Mahotsava merely as an annual festival but promote it all the year round according to the local seasons More than all the benefits that must accrue from this nation-wide planting of trees in private and public lands, the Van Mahotsava movement has done much towards creating a tree if not forest consciousness among the people

First Five-Year Plan Period

New Forest Policy

A most significant first step forward in this developmental activity was the enunciation of a new National Forest Policy of India in 1952, revising the old policy of 1894 The Forest Policy prescribed (as a most desirable objective) one-third of the total land area for maintenance under forests It also called for a detailed survey to lead to proper land use, emphasised the soil conservation aspects of forestry, urged the need for weaning forest tribes away from their age-long practice of shifting cultivation in forest areas and pointed out the need for wide publicity on the value of forests both in the economic and the physical spheres.

Land Management

The area under forests in India in 1949-50 was 14 7 million acres, 18 per cent of the total land area Therefore, the need for an immediate reconnaissance survey of waste lands in order to evolve a system of balanced and complementary land use was suggested in 1953 A soil conservation Board was also set up in 1952

Forest Schemes in the First Plan

Thus, the post-war reconstruction activity which began in specified areas and with limitations of funds was progressively transformed into a full-fleged five-year development plan the First Five-Year (1951—56) Plan

The first plan period, rather curiously, was primarily one of forest consolidation, as a result of which the bulk of the forests in India became State-owned During this period, large areas of forests came to vest in the State Governments as mentioned earlier In addition, the Plan included schemes for afforestation and plantation improvement of forest communications, preparation of working plans, demarcation of newly acquired areas (as an initial work for their rehabilitation), improving the growing stock and strengthening of forest administration In short, all the States adopted the revised Forest Policy and endeavoured to implement its various directions in their planned efforts at forest development This included works on afforestation, rehabilitation-planting and commercial plantations, carried out over an area of about 30 350 ha (75,000 acres) Special mention may be made of some of the schemes, by way of examples of trends in forest development in the country In Saurashtra (subsequently part of Gujarat State) a scheme for improving the Gir Forest was taken up in 1954-55 In Bihar, two divisions were set up for afforestation work, one in Hazaribagh and the other in North Bihar, the former afforested an area of about 2,225 ha (5,500 acres) and the latter carried out a detailed survey of lands suitable for afforestation, besides undertaking some pilot-scale afforestation in this tract Assam exceeded its afforestation target of 1,799 ha (4,445 acres) In West Bengal about 1,200 ha (3,000 acres) of waste lands (mostly lateritic) were planted up In PEPSU (later, part of the Punjab) an area of about 800 ha (2,000 acres) was planted with the help of irrigation

The development of forest communications was on the programme in almost all the States Over 4,800 km (3,000 miles) of forest roads were constructed or improved during the plan period.

This in turn led to great increase in the use of motor lorry transport, progressively replacing the slow bull or cart for the extraction of timber and forest produce Further, several forest areas, hitherto considered inaccessible areas, were rendered accessible and were opened up for timber exploitation and regular forest operations

Improved Forest Management

Owing to the abolition of the Zamindaris and the merger of the princely States, more than 8 million ha (20 million acres) of forest land under private ownership were brought under State control, and in order to deal with them, the administrative set up was strengthened. Madras, Bihar, West Bengal and Uttar Pradesh brought into existence a number of new Forest Divisions for taking over private forests and also for implementing new plans of afforestation in predominantly agricultural districts In some States, schemes suited to local needs were drawn up and co-operative societies associated with forest management and working At the end of the Plan, there were, for instance, 73 forest co-operative societies in the Punjab responsible for a forest area of 24,072 ha (59,484 acres) of which 16,089 ha (39,756 acres) were stated to have been brought under scientific management In Bombay State, encouragement to Co-operative Societies of forest workers (to replace contractors) became a regular feature in the working of fuel and small forests

Industrial Plantations

A new feature of this period was the special emphasis on plantations of industrial importance, with a view to providing for increasing future demands from industries, such as the match, plywood, packaging, textile, sports goods, tanning and pharmaceutical industries Many of such plantations were established in areas which till then contained little tree growth or in which the forests had been over-exploited in the past under private ownership and were in need of rehabilitation In places, these plantations also helped to check erosion and the spread of arid and desert conditions For example in Uttar Pradesh, 6,576 ha (16,250 acres) were so planted, Madras covered an area of about 3,200 ha (8,000 acres) with ...atchwood species, wattle, blue gum and *Casuarina*, Mysore brought an area of 350 ha (2,100 acres) under *Casuarina* and *Eucalyptus* and over 16 ha (40 acres) under cinchona, Assam carried out its programme of planting 400 ha (1,000 acres) under cinchona and 240 ha (600 acres) under wattle

First Timber Trends Survey

A Timber Trends Survey for the country was initiated towards the close of the Plan period in collaboration with the Food and Agriculture Organisation and the Economic Commission for Asia and the Far East of the United Nations The object was to collect data regarding present demands for timber and other important forest produce, their production, utilization, consumption and end-uses and to indicate future trends This survey was subsequently completed in the year 1957 It has been largely helpful in assessing the existing and anticipated gaps between demand and supply of forest produce in the country and thus in long-term planning being attempted on a rational basis

Colonisation

A programme for clearing forests and settling colonists in Andaman and Nicobar Islands was included in the five-year plan of that territory. Clearing was by contractors' agency in the North Island and by the Forest Department in the Middle and South Islands By the end of 1955, 2 000 ha (5,000 acres) were cleared and about 1,000 families were settled, involving a total expenditure of Rs 68 lakhs This programme envisaged rehabilitation of refugees from East Pakistan and at the same time aimed at providing much-needed labour resources for developing these forest tracts

Wild Life Conservation

The Indian Board for Wild Life was constituted in 1952 and has since done useful work to advance the cause of preservation of Wild Life in the country Work on the Delhi Zoological Park was begun This project aimed at establishing modern zoological garden in the capital Initial difficulties regarding sites, staff and technical advice were overcome by the end of the Plan period

Forestry Education

Facilities for higher education in forestry were further enlarged during the first Plan Annual admissions to the officers' course in the Indian Forest College, Dehra Dun, were increased from 30 to 40 Similar expansion was also organised in respect of the training of Rangers Additional accommodation was constructed to meet the needs of further expansion Training at the sub-professional levels (Foresters and Forest

Guards) was left mostly to the States, West Bengal, Orissa, Uttar Pradesh, Madhya Pradesh, Rajasthan, Punjab, Jammu and Kashmir and Bombay established new schools of their own or enlarged existing ones, for training Foresters to meet their increased needs, but the Government of India established a Foresters' Training course of twelve months' duration at Coimbatore to serve the Southern States

Forest Research

At Dehra Dun (which was still the only centre in India for forest research) 34 special schemes were drawn up by the Forest Research Institute, but owing to delays in procuring suitable staff and equipment, many of them could be initiated only towards the end of the plan period Equipment worth about Rs 44 lakhs was secured under the Indo-U S Technical Co-operation Programme, particularly to bring into operation the pilot paper plant acquired earlier in 1949 Following on a survey of the cane resources of the country, experiments were undertaken for the improvements of indigenous canes and for the introduction of exotic varieties of cane into India Seeds of good varieties, as also planting stock, were obtained for the purpose from the Philippines, Thailand, Indonesia and Malaya and subjected to necessary trials

Studies in the protection of timber against marine organisms were undertaken for the first time and six field stations were established in important coastal centres Schemes were also undertaken for the preservative treatment of green bamboos in order that bamboo may really be developed into 'the poor man's timber' The first volume of a revised, enlarged and up-to-date nine-volume edition of Gamble's "Manual of Indian Timbers" was completed (illustrated with micro-photographs prepared specially for the purpose) and was in the press

Soil Conservation

It would be interesting to record that for the initiation and early development of soil conservation measures in India, full credit must go to the Forest Departments Mention may be made of the pioneer efforts from the thirties in the Hoshiarpur Shiwaliks in the Punjab and the large-scale work of bunding, etc in forest and in agricultural lands in Bijapur and other districts of Bombay State from the forties But it was only during the First Five-Year Plan that soil conservation began to receive all over India for the first time the priority attention due to it The aim of soil conservation would be, stated in general terms to protect the top layers of the soil which were otherwise apt to be constantly shifted from one area to another by wind and water A preliminary reconnaissance survey showed that about 25 per cent, of the country's land surface was urgently in need of soil conservation measures It was estimated that some 80 million ha (200 million acres) of land were exposed to hazards of wind or water erosion, and of lands actually under cultivation about 40 million ha (100 million acres) were vulnerable to erosion, as considerable parts of such lands would lie fallow for several months periodically The Western desert in Rajasthan alone accounted for about 20 million ha (50 million acres), of this about two million ha (five million acres) required to be afforested and the rest were in need of such conservation programme as closure to grazing and rotational grazing for the betterment of the seasonal pasture lands Another 20 million ha (50 million acres) in the drier districts consisting of open pastures waste lands and extensive ravines required levelling, terracing, gully plugging, turfing and planting of trees The development of power and irrigation projects in river valleys led to the recognition of the need for special attention to soil conservation in the catchment areas in the hills

To carry out the soil conservation programme under the Five-Year Plan, a Central Soil Conservation Board was set up (by the Ministry of Food and Agriculture, India) towards the end of 1953 The Board assisted State Governments and River Valley Authorities in drawing up plans, arranged for training of technical personnel for this new field of service, acted as a clearing house for information and recommended financial assistance for States' schemes The Board also undertook research, demonstration and extension work in soil conservation Besides expenditure on such Centrally administered items, the Board arranged for the sanction of a total expenditure of Rs 47 lakhs for the soil conservation programmes of the State State Soil Conservation Boards were established in all States

A Desert Afforestation Research Station was established at Jodhpur for investigating methods of desert control by creating vegetal cover and shelter belts The station established nine nurseries in the western parts of Rajasthan, where various trees and grasses were raised for experimental afforestation, planting of avenue trees and distribution to various agencies During the three years 1952—55, about 32,000 kg (71,000 lbs)

of seeds of different species were distributed, trees were planted alongside 240 km (150 miles) of roads and 78 sq km (30 sq miles) of desert area was afforested Also 26,000 sq km (10,000 sq miles) were earmarked for pasture improvement and experimental fodder plantations Regional research stations were also proposed for location at Dehra Dun, Kotah, Bellary, Ootacamand and Vasad (Anand)

By the end of the First Plan some 120,000 ha (300,000 acres) of land was treated for soil conservation This includes 60,000 ha (150,000 acres) of contour bunding on agricultural land and afforestation of 4,555 ha (11,256 acres) of waste land A programme of soil conservation in the catchment areas of river valley projects was also recommended in the First plan The Soil Conservation Board rendered financial assistance to States for the execution of the programme

During the Plan period, 20 gazetted and 119 other officers were trained at the regional research stations established by the Central Soil Conservation Board Subordinate personnel were trained in centres established in the States Arrangements were completed for stepping up training facilities during the Second Plan period Training facilities were also organised by the Damodar Valley Corporation at Hazaribagh The States of Uttar Pradesh, Bombay and Saurashtra established their own training centres In several States pilot-scale demonstration projects were also taken up

The total expenditure on special development scheme during the First Plan period under 'Forest' and Soil Conservation' was of the order of Rs 120 millions How this amount was allocated as between the different States and utilised by them will be apparent from the statement below —

TABLE No 1

First Plan Development Expenditure in various States and in Centrally Administered Areas

(In lakhs of Rupees)

States	First Plan including adjustments
1	2
PART 'A' STATES	
1 Andhra	14 5
2 Assam	47 4
3 Bihar	125 0
4 Bombay	83 8
5 Madhya Pradesh	39 7
6 Madras	74 3
7 Orissa	17 2
8 Punjab	60 4
9 Uttar Pradesh	141 8
10 West Bengal	63 7
Total Part 'A' States	667 8
PART 'B' STATES	
11 Hyderabad	21 4
12 Madhya Bharat	48 0
13 Mysore	8 4
14 PEPSU	43 4
15 Rajasthan	21 0
16 Saurashtra	19 5
17 Travancore & Cochin	
18 Jammu & Kashmir	16 8
Total Part 'B' States	178 5
PART 'C' STATES	
19 Ajmer	10 6
20 Bhopal	20 0
21. Coorg	1 00
22 Delhi	2 7
23 Himachal Pradesh	17 8
24 Kutch	1 4
25 Manipur	2·0
26 Tripura	10 5
27 Vindhya Pradesh	22 5
Total Part 'C' States	89 8

TABLE No 1—*concld*

1	2
UNION TERRITORIES	
28 Andaman & Nicobar Islands	89 8
29 Pondicherry	
30 NEFA	26 2
Add Government of India—Research & Other Programmes	100 0
Total	216 0
Grand Total ..	1,062 3

NOTE—1. 10 Lakhs One Million

2 In addition, Rs 140 lakhs were spent on soil conservation schemes

The Second Five-Year Plan

The First Five-Year Plan ended in March 1956 and the Second Five-Year Plan followed immediately The total provision for forest development in the Second Plan was about Rs 270 millions, with which it was planned to achieve a more comprehensive programme of development In addition to continuing, wherever necessary, work on the scheme initiated during the First Five-Year Plan, the programme of the Second Plan included the following —

(i) afforestation and improvement of poorer areas in the forests and extension forestry,

(ii) plantations of species of commercial and industrial value,

(iii) measures for increased production and extraction of timber and other forest produce in the immediate future,

(iv) conservation of wild life

(v) amelioration of the conditions of staff and labour in the forests,

(vi) increased tempo of forest research,

(vii) increased provision for training of technical personnel, and

(viii) central co-ordination and guidance in the implementation of forest development schemes all over the country

Detailed programmes were drawn up by different States on a fairly uniform and systematic basis consistent with local requirements The Central Government paid special attention to research, education, demonstration and co-ordination and the States carried out the forest development project in the field The State-wise allocation of planned expenditure is shown in the statement below —

TABLE No 2

Second Plan Development Expenditure in the various States of India and in the Centrally Administered Areas

In lakhs of Rupees

States	Second Five Year Plan	
	Forests	Soil Conservation
1	2	3
PART 'A' STATES		
1 Andhra	69 47	72 96
2 Assam	92 91	8 07
3. Bihar	436 56	57 00
4 Bombay	218 81	331 03
5 Madhya Pradesh	164 57	62 92
6 Madras	146 20	118 70
7 Orissa	47 74	48 76
8 Punjab	113 42	..
9 Uttar Pradesh	229 40	183 19
10 West Bengal	115 89	73 62
Total Part 'A' States	1,634 97	956 55
Part 'B' States		
11. Hyderabad	58 90	103 55
12 Madhya Bharat	59 40	75 60
13 Mysore ..	46 03	80 75
14 PEPSU	38 00	35 80
15 Rajasthan	120 00	54 00
16 Saurashtra	68 44	130 23
17. Travancore-Cochin ..	89 35	30 88
18 Jammu & Kashmir	58 90	36 10
Total Part 'B' States	539 02	546 91

TABLE NO 2—*concld*

	1	2	3
	Part 'C' States		
19	Ajmer	5 00	3 00
20	Bhopal	37 18	10 65
21	Coorg	6 84	4 75
22	Delhi	11 40	
23	Himachal Pradesh	34 67	19 95
24	Goa ..	7 40	
25	Manipur	3 22	0 40
26	Tripura	11 20	0 90
27	Vindhya Pradesh ..	59 85	14 25
	Total Part 'C' States	176 76	53 90
	ON TERRITORIES		
28	Andamans and Nicobar Islands	80 00	0 60
29	NEFA	41 80	
30	Pondicherry		0 42
	Total—Union Territories	121 80	1 02
	Add Government of India Research Demonstration & Training Schemes	240 00	400 00
	Grand Total	2,712 55	1,958 38

NOTE —

1. 10 lakhs=One million.

2 Actuals of expenditure not yet finally available for the Second Plan period (ended 31 3 1961) After the period began, in November 1961, there was a reorganisation of States reducing the total number of 14 autonomous States and six Centrally administered territories Towards the end of the period, in 1960, one of the States, Bombay, was again split into two, thus making the total number of States 15

The out-lay of Rs. 1,958,38 lakhs proposed under soil conservation included programmes for tackling erosion problems of all kinds in agricultural lands, deserts, coastal sand dunes, hill regions, waste lands and lands eroded by sea.

Short notes are recorded on achievements under some of the more important schemes —

Forest Consolidation

A large area of degraded forests had come under State control following the integration of princely States and the abolition of the Zamindary system Many of these forest lands were not demarcated on the ground or even indicated on maps These extensive areas required urgently to be defined on the ground and suitably notified under the Forest Acts in order to save them from further unregulated exploitation and denudation The first task of the Forest Department was, therefore, to undertake surveys of such areas, and arrange for their rehabilitation and better management About 1,54,000 ha (3 80,000 acres) were tackled under this programme, thus augmenting the *effective* forest area of the country.

Extension Forestry

Recognising the extreme difficulty in securing any land already under other use, especially in thickly populated areas, for increasing the extent of forests, measures of extension forestry were encouraged to a considerable extent, such as tree plantations along canal banks, in road-side avenues in the form of shelter-belts and on village waste-lands It was hoped that many of these plantations would prove productive in the long run, besides helping to bind and stabilise the soil in these vulnerable sites

Commercial Plantations

Forest working plans were providing mainly for the formation of timber plantations and that on the limited scale necessary for ensuring regeneration to justify working on a sustained yield basis Not all the areas suitable for planting were even tackled Thus, there was much scope for increased and intensive work along these lines When the country's needs for timber and other forest products already exceeded production levels and were likely to increase further it was imperative that economic plantations should be formed to the fullest extent possible and in the shortest period For this purpose, mostly degraded forest areas or bare lands were utilised, while the normal working plan programmes were adhered to in the regular forest tracts The Second Five-Year Plan included proposals for raising about 20,000 ha (50 000 acres) of commercially important species like teak Match-wood plantations were established on a larger

scale than in the first plan [about 20,000 ha (50,000 acres)] A further 5,300 ha (13,000 acres) were planted with species like wattle and bluegum of value to the tanning, paper and rayon industries Plantations of *babi* grass, suitable for paper making, were also extended

Improved Exploitation

The schemes described above were in the nature of long-term measures of forest improvement The plan included measures to help increase the output in the immediate future, such as adoption of better techniques for timber extraction, development of forest communications and increased use of preservative and seasoning processes The plan also provided for the introduction of improved logging methods, particularly with reference to the use of efficient tools for felling and extraction The use of simple wire ropes and other similar devices was extended in order to bring under working even relatively remote and inaccessible hill areas About 11,900 km (7,400 miles) of forest roads were constructed or improved

Forest Statistics

Much difficulty was felt in planning and development of forest resources due to lack of basic national statistics The first Timber Trends Survey was completed and the report made available by early 1958, in order to make good this deficiency

The Conservation of Wild Life became an integral part of forest administration, especially in view of the imperative need for protecting India's rich but vanishing heritage of wild life It was increasingly apparent that the reserved forests were becoming the last refuge of the country's wild life, in the face of increasing human activity outside Such notable animals as the lion and the rhinoceros were confined to small pockets and were still in danger of extinction in spite of the live interest in them for the previous two decades or more To serve the cause of wild life, forestry programmes in the Second Plan included the formation of 18 National Parks or Wild Life Sanctuaries, besides the establishment of a zoological park in Delhi on modern lines

Forest Research

Research programmes initiated during the First Five-Year Plan were further expanded New lines of investigation included studies in logging methods, timber engineering, plant introduction and genetical problems A regional research station in two sections was started in the South biological and silvicultural problems to be studied in the section (located in conjunction with the Southern Forest Rangers' College) at Coimbatore, and forest products research to be undertaken at Bangalore, utilising the Mysore Government's Forest Research Laboratory as a nucleus

Forestry Education

The requirements of fresh forest personnel during the Second Five-Year Plan was estimated as 250 forest officers The normal likely output of the Forest College at Dehra Dun of about 150 had to be stepped up Similarly, the training arrangements for Forest Rangers had also to be enlarged upon in the colleges both at Dehra Dun and Coimbatore in order to provide for an annual output of about 160 men About 2,000 Foresters were needed for implementing the various programmes included in the Second Five Year Plan and arrangements were made locally in the States for their training

Soil Conservation

During the Second Plan, soil conservation work was proposed over some 1·2 million hectares (3 million acres), giving priority to much of those tracts as were seriously affected by soil erosion The programme attempted to tackle erosion problems of all kinds on agricultural lands, deserts and coastal areas affected by sand dunes, catchment areas of river valley projects hilly regions, ravine lands over-grazed waste lands, and lands eroded by sea The Forest Departments were mainly concerned with the afforestation of eroded and denuded hills Reconnaissance surveys on a regional basis were also taken up to collect essential data regarding the present land use pattern, soil characteristics, degree of erosion, etc A provision of Rs 65 lakhs was made in the Second Plan for surveying, classifying and mapping about ten million acres of land, primarily in areas which presented special problems

The Third Five-Year Plan

The Second Five-Year Plan was executed between April 1956-March 1961, and India has just started on her Third Five-Year Plan of development In respect of forests, the First Five-Year Plan made a good start with the adoption of the

revised Forest Policy Afforestation and rehabilitation plantations formed the main fields of development in that period, following post-war reconstruction In schemes like 'Forest Communications' and 'Improved Logging' a start in the right direction was made, but actual achievements were meagre The Second Plan aimed mainly at an enlargement of the processes initiated in the First Plan and provided for large increases in the tempo of forest development Forest consolidation and vastly enlarged organisation of forest roads and techniques of forest exploitation characterised this period, besides expansion of commercial and industrial plantations The one major feature of the Third Plan is the large provision for extending forests and creating tree crops outside the regular forests Some of the major schemes like forest plantations, rehabilitation of degraded forests, survey and demarcation and improvement of communications will also be proceeded with progressively during the period

Farm Forestry

As stated earlier, the new National Forest Policy of India aimed at increasing the overall extent of areas under forests to 33⅓ per cent of all land areas Even though this objective was reiterated over and over again, little progress could be made in the actual realisation of this ideal on account of the immense pressure of the rapidly increasing population, reluctance of the mainly agricultural people to part with land howsoever uneconomic for agricultural purposes, clamour from the landless and lack of really effective action on the part of Governments in practice to implement it As it became clear that it would be more than an achievement if existing forest areas could all be continued as such in perpetuity, it was realised that atleast the objective of increasing forest resources should and could be achieved by such measures as bringing under tree crops all lands not fit for sustained agriculture, all wastelands, village commons, etc With these objects in view, the Third Plan has incorporated in its forest development programme, a large scheme for "Farm Forestry" This scheme will extend tree planting and forestry activities to areas outside departmental forests Fuel and fodder plantations will be created on all suitable waste-lands in village commons and tank foreshores, along canal banks, etc A first purpose of this project will be to create local fuel resources and thus free the agricultural population from dependence on departmental forests for small requirements, this will enable diverting farm yard manure to its correct use for manuring the fields instead of being burnt as domestic fuel To produce 154 million cu m (109 million tons) of firewood, which is the anticipated shortage by 1975, plantations of 1 6 million ha (4 million acres) of fast-growing species will be required Such large-scale plantations will only be possible with the willing cooperation of the people It is proposed that these fuel and fodder species will be planted in village localities through the good offices of the community and development blocks Nearly 500 million rupees have been provided for this scheme alone during the Third Plan

Economic Plantations

The Third Plan includes continuance of nearly all the special activities needed further to develop the forests. Specific attention has also been given to the economic aspects in working out the detailed forest programme for the Third Plan A steady increase in forest outlay is visualised from year to year, through intensive forest development schemes such as planting of fast-growing and valuable species Forest schemes are also to be correlated directly with schemes of industrial development during the next few decades Thus, the schemes for raising plantations of economic value have been placed next only to farm forestry in importance Timber production in India has all along been limited to what could be taken out of existing forests, under conservative management mostly depending upon natural regeneration methods. While this has ensured that the existing forests remained in good shape, it has resulted neither in the full utilisation of the productive capacity of the soil nor has it taken into account the needs of the country in respect of this basic raw material Consequently, the present output of India's forest is very low Recourse to intensive forestry practices is urgently indicated if the gap between supply and production is at all to be bridged speedily It is clear that, except in the areas of limited extent where natural methods of replacement of existing forest crops are readily successful, large scale plantations must be resorted to in order to utilise the soil potential fully Such plantation activity began during the First Plan and continued during the Second Plan period, provision has been made to step up this activity further during the Third Plan period 40,000 ha (100,000 acres) will be planted with teak 2,000 ha (5,000 acres) with sal and 2,000 ha (5,000 acres) with conifers, in addition to 120,000 ha (300,000 acres) with

miscellaneous species A provision of a little over Rs 180 millions has been made for these works

Forest Resources Surveys

While some forest resources of conventional utility are assessed from time to time when preparing or revising individual working plans, very little has so far been done to determine comprehensively the variety and extent of the forest resources Such resources surveys have been recognised as an essential first step in any organised developmental activity in forests or for starting industries based on forest products as raw materials The recent Commonwealth Forestry Conference (Australia—New Zealand 1957) laid great emphasis on this aspect of forestry Such a survey would not only determine the existing resources with a view to their maximised utilisation, but would also examine the question of the best use of the forest soils concerned It is envisaged that such a survey will be conducted State by State at an estimated total expenditure of Rs 10 millions

Improvements to forest grazing and pasture have to receive increased attention to the interest alike of balanced agricultural development and sound forest management The Second Plan provision of Rs 1 2 millions was considered meagre For the Third Plan, a provision of Rs 10 millions has been made Arrangements will be made for rotational grazing and periodic closure of grazing areas Suitable fodder trees and grasses will be planted wherever possible

Wild Life Conservation received much attention in the Second Plan period, work did not progress, however, on the scale visualised Much has to be done in the Third Plan towards constitution and development of National Parks and Wild Life Sanctuaries, improvement of existing zoos and setting up of new ones in important places A provision of Rs 30 millions has been made under this scheme

Minor Forest Products

Schemes for the development of minor forest produce will receive increased attention during the Third Plan period, when Rs 10 millions will be spent for the purpose Indian forests abound in a vast variety of valuable minor forest produce Quite a few of these feed modern industries and some are valuable items of foreign trade; the resources survey is likely to result in their increased output and intensive utilisation or export

Improved Forest Utilisation

The scheme under timber operations and forest utilisation provides for Rs 17 5 millions Recent investigations by foreign experts have shown that there is great scope for improvement in our manual working methods The improvement in tools and mechanical contrivances is expected to lead to a considerable reduction of waste and a fuller utilisation of our wood resources, so necessary when there is an acute shortage of these materials The provision under this scheme will be utilised for equipping forest workers with and training them in the use of better implements

Forest Research

For the development of forest research a provision of Rs 20 millions has been made During the Second Plan, the entire provision made was not utilised on account of various difficulties such as import restrictions, scarcity of technically qualified staff, foreign exchange problems, etc It is hoped to make good these deficiencies under the Third Plan period. Besides the Southern Research Station, plans are in hand to set up an eastern station in Assam and another in the western region of the country

Amenities for Forest Workers

Attention has also been given in the Third Plan for labour and other amenities Forest labour is yet to be organised on a systematic footing, most of it for the present being casual or part time in nature Import of labour, particularly sawyers, from distant areas and their accommodation for the season in the areas being worked are a common feature The need for permanent labour forces for cultural and plantation works is increasingly felt Adequate facilities like housing, medical facilities, water supply, schooling for children of labour are all sure to attract more labour and result in more efficient working During the Third Plan period, an increased provision of Rs 10 millions has been made

'Soil Conservation' which started as a limb of 'Forestry' in the beginning of the first plan period, has since branched off into a major field of national development

The following gives a summary of the various forest schemes of the Third Plan, indicating the total provision (for all the States together) made for each

TABLE No 3

Summary of Third Five-Year Plan Schemes

In lakhs of Rupees

	Scheme	Amount
1	Extension Forestry (Farm Forestry)	5,000 00
2	Economic —	
	(*a*) Plantations	1,425 00
	(*b*) Extension Forestry	400 00
3	Consolidation	640 00
4	Forest Resources Survey	100 00
5	Working Plans	300 00
6	Rehabilitation	1,000 00
7	Grazing etc	100 00
8	Nature conservation	200 00
9	Minor Forest Produce	100 00
10	Timber operations and Forest Utilisations	175 00
11	Training of Staff	250 00
12	Forest Research, etc	200 00
13	Communications	700 00
14	Buildings	500 00
15	Labour and Amenities	100 00
16	Publicity	100 00
17	Forest Protection	300 00
	Total	11,690 00

The provisions under the Third Plan are almost four times those of the Second Plan The total revenue surplus nowadays over normal working of the forests of India is 353 353 millions (1959-60) annually, with a tendency to rise from year to year In the present still under-developed stage, it would not only be desirable but also reasonable to plough back a substantial part of it into the forests This will really be an investment for a brighter future During 1959-60, the expenditure in Five-Year Plan and Development was Rs 58 052 millions and the net surplus after meeting both normal and development expenditure was Rs 295 301 millions It is estimated that the surplus of forest revenue in the Third Plan period will not be less than Rs 1,500 millions In other words, the proposals for the Third Plan are likely to involve only 44 6 per cent (excluding expenditure on farm forestry) of the revenue surplus for the five-year period With this increased provision under the Third Plan, it is hoped that attention will be focussed on intense forest development all over the country All the States have formulated their plan proposals for 1961-62 and most of the schemes are well under way from April 1961



CHAPTER VIII

DESCRIPTIVE AND STATISTICAL

Area under Forests

The area under forests comprises 783,962 sq km (302,688 sq miles), constituting only 24 per cent of the total geographical area The per capita forest area is only 0 22 ha (0 54 acre) compared with 5 5 ha in the USSR, 3 8 ha in North America and 1 6 ha for the world as a whole This is even less than 0 3 ha per capita for Asia

Not only is the forest area proportionately smaller in India, but it is also unevenly distributed This is especially remarkable when considered in relation to the population which the forests have to serve Thus, while Assam, Manipur and Tripura at one extreme have over one hectare (2 5 acres) per capita, at the other extreme, West Bengal, Kerala, Madras, Uttar Pradesh and the Punjab have 0 09 ha (0 23 acre) or less per capita

Madhya Pradesh has the largest area under forests with 182,468 sq km (70,451 sq miles), while West Bengal has the least area with 12,246 sq km (4,728 sq miles) Assam including N E F A has the highest percentage of forests (42 6 per cent), while Punjab has the lowest (11 7 per cent) The National Forest Policy enunciated in May 1952, (reproduced as an Appendix in Volume II) lays down that "India as a whole should aim at maintaining one-third of its land under forests, the proportion being 60 per cent for hilly regions and 20 per cent in the plains" A planned extension of regular forests would, therefore, be essential to meet the above needs The Table below furnishes the statistical data for India as a whole The State-wise figures, which are available, are furnished in Tables I, IA, II and II-A

TABLE No 4

Total area and classification of area

I	*Forest area*—783,962 sq km (302,688 sq miles=193,720,320 acres)
II	*Area permanently devoted to agriculture (including short-term fallow)*—1,500,807 sq km (579,462 sq miles)
III	*Area not available for agriculture or forestry*—382,631 sq km (147,734 sq miles).
IV	*Area potentially productive under agriculture or forestry*—595,475 sq km (229,913 sq miles)
V	*Total geographical area*—3,263,354 sq km (1,259,982 sq miles)

TABLE 4—*Contd*

VI	*Forest area as a percentage of geographical area*—24
VII	*Total population in millions*—361 2
VIII	*Density of population*—111 per sq km (287 per sq mile)
IX	*Forest area per capita*—0 22 ha (0 54 acre)
X	*Total livestock population*—307 millions (159 millions of cows and bulls 47 millions of buffaloes and 103 millions of other live-stock)
XI	*Head of live-stock per unit area of forest*—3 95 per ha (1 6 per acre)
XII	*Head of live-stock per unit area under agriculture*—2 04 per ha (0 83 per acre)

Classification of Forests by Ownership

The forests owned or managed by the State through the Forest or other Government Departments during 1957-58 comprised 723,610 sq km (279,388 sq miles), forming 92 3 per cent of the total forest area Those owned by corporate bodies and private individuals were 42,150 sq km (16,276 sq miles) and 18,190 sq km (7,024 sq miles), forming 5 4 per cent and 2 3 per cent respectively In 1949-50, State forests constituted 77 2 per cent communal forests 0 3 per cent and private forests 22 5 per cent of the total forest area The substantial increase in State-ownership and the corresponding reduction in private forests is the result of the abolition of Zamindari estates including forests and their acquisition by States during the course of the last decade

Andhra Pradesh, Bihar, Jammu and Kashmir, Madhya Pradesh, Madras, Rajasthan, Andaman and Nicobar Islands, Manipur and Tripura have all forests under State ownership, while Kerala (28 per cent) and Punjab (33 per cent) have marked extents under private forests The National Forest Policy of May 1952 has laid down that "the control and management of private forests should be strictly regulated and where that cannot be ensured, they should be acquired by the State through effective legislation" All States have enacted legislation to regulate the working of private forests

No information is available on farm forests raised by cultivators in their private holdings including the back-yards of their houses, along field bunds, in village common lands, etc With the increasing tempo of the *Vana Mahotsava* movemen

the Festival of Trees), the area under this category may be appreciable Exact data are not forthcoming, but these may come up to, say, 1 per cent of the total cultivated area or about 15,000 sq km (5,800 sq miles)

Classification by legal status

The forests of India [783,960 sq km (302,683 sq miles)] are classified under the following categories—

(i) *Reserved Forests*—So constituted under the provisions of the Indian Forest Act or other forest law in force in the State—369,500 sq km (142,664 sq miles), forming 47 1 per cent of the total forest area

(ii) *Protected Forests*—These constituted under Chapter IV of the Indian Forest Act and forest areas notified as reserved lands under the provisions of the Madras Forest Act for a limited degree of protection—237,840 sq km (91 829 sq miles), forming 30 3 per cent of the total forest area and

(iii) *Unclassed Forests*—Other forests and waste-lands belonging to both Governments and private individuals and bodies—176,630 sq km (68,195 sq miles), forming 22 6 per cent of the total forest area

The State-wise data are furnished in Tables III and III-A

Reserved and protected forests constitute permanent forest estates, maintained for the purpose of producing timber and other produce and for protective reasons As such, they fall within the category of "permanent forests", as used by the Food and Agriculture Organization in its World Forest Inventory Unclassed forests are largely, degraded and unprofitable forests, rarely surveyed or subject to any organized protection or management

The total extent of permanent forests in India as per present available data, is 607,340 sq km (234,493 sq miles), forming 77 4 per cent of the total forest area

Classification of forests by composition

Forests may be broadly classified as (i) coniferous and (ii) non-coniferous or broad-leaved A sub-division of the latter type under the economically more valuable species and types, such as teak, sal, evergreen and miscellaneous will be touched upon in the light of available statistics

By composition, India's forests are predominantly non-coniferous Conifers occupy only 2 6 million hectares (10,040 sq miles), comprising a very meagre 3 3 per cent of the total forest area These are confined to the Himalayas for the most part, in the States of Jammu & Kashmir, Punjab, Uttar Pradesh, Himachal Pradesh and to a smaller extent in Assam, West Bengal and Manipur Important Indian conifers are deodar (*Cedrus deodara*), *chir*-pine (*Pinus roxburghii*), blue pine (*P wallichiana*), Khasi pine (*P insularis*), spruce (*Picea smithiana* and *P spinulosa*) and fir (*Abies pindrow* and *A. spectabilis*)

Broad-leaved forests occupy 75 8 million hectares (292,648 sq miles), forming 96 7 per cent of the total forest area These forests are composed of a very large number of species, only a few of which are at present of value Among timbers of national importance may be mentioned teak, sal, laurel *gurjan* and some others Some timbers like rosewood (*Dalbergia latifolia*), *pali* (*Palaquium ellipticum*), Andaman *padauk* (*Pterocarpus dalbergioides*) and sandal (*Santalum album*) enjoy a wide export market

Teak forests are found largely in the States of Andhra Pradesh (9,145 sq km), Gujarat (7,208 sq km), Maharashtra (9,464 sq km), Kerala (5,698 sq km), Madhya Pradesh (41,463 sq km) Mysore (3,445 sq km) and Rajasthan (5,180 sq km The total area, including small areas in other States, works out to 82,703 sq km (32,318 sq miles)

Sal forests comprise a total of 114,377 sq km (44,161 sq miles) and are chiefly found in the following States—

Madhya Pradesh—37,682 sq km (14,549 sq miles)

Bihar—33,504 sq km (12,936 sq miles)

Orissa—28,733 sq km (11,094 sq miles)

Uttar Pradesh—5,716 sq km (2,227 sq miles)

West Bengal—5,232 sq km (2,020 sq miles)

Assam—2,709 sq km (1,046 sq miles)

Miscellaneous forests occupy 561,989 sq km (216,984 sq miles) These include the magnificent wet evergreen, semi-evergreen and moist mixed deciduous forests of Assam, West Bengal, Andamans Kerala, Mysore and Madras The bulk of them, however, comprises dry deciduous forests containing bamboos, small timber for local use, fuelwood and grazing Some dry deciduous forests of Mysore and Madras contain the valuable sandal tree (*Santalum album*), the wood of which is largely exported Many of the miscellaneous species found in these forests, such as *Vateria indica, Trewia nudiflora, Salmalia malabarica, Ailanthus excelsa, Alstonia scholaris, Kydia calycina* and *Boswellia serrata* are used as raw materials in the plywood, match and pulp industries.

Two species of bamboos, *Dendrocalamus strictus* and *Bambusa arundinacea*, are often found

gregariously in India's forests, the former occupying a much larger extent than the latter Bamboo plays a very important role in the national economy, being a raw material for paper-making, in timber for house construction and for a variety of addition to its primary function as the poor man's other purpose About 36,000 sq km (14,000 sq miles) may be said to carry bamboo stands These include the very considerable areas of teak and mixed miscellaneous forests where bamboos occur in the second storey Bamboos are also cultivated in appreciable quantities by villagers in their home-steads to meet purely local requirements

Classification of forests by functions

Of the total of India's forests, 92,410 sq km (35,681 sq miles) or 12 per cent comprise protection forests These are managed primarily to regulate stream flow, prevent erosion, bind shifting sands or exert any other beneficial influence on the adjoining country The yield from these is very small as removals are limited to salvage or sanitation fellings They are of particular significance in hilly tracts and along river courses

Production forests form 691,550 sq km (267,007 sq miles) or 88 per cent of the total forest area of the country But only 70 per cent of the total forest area is actually merchantable With the expansion in the domestic and industrial consumption of forest products, extension of communications and reclamation of derelict areas, we may expect a gradual diminution in non-merchantable areas

Out-turn of Home Grown Wood (Tables IX & IX-A)

The total production of wood in the country is 16 2 million cu m (579 3 million cubic feet), of which 31 per cent or 5 2 million cu m (185 million cu ft) constitutes industrial wood and the balance 69 per cent fuelwood (including charcoal wood) The percentage of industrial wood to total out-turn of wood in other countries ranges from 8 per cent in Africa and 15 to 17 per cent in South and Central America to 85 per cent in North America

India's total wood production is just 1 per cent of that of the world and 18 per cent of that of Asia Considering that the total forest area of India is 1 8 per cent of that of the world and 15 per cent of that of Asia the wood production per unit area falls lower than that of the world and is just a little better than that of Asia as a whole

The bulk (90 per cent) of the country's wood out-turn is of broad-leaved species (14,575,000 cu m or 520,540,000 cu ft) 79 per cent of coniferous wood produced (1,644 000 cu m or 58,720,000 cu ft) is used as industrial wood and only 21 per cent as fuel wood The high consumption of the relatively unsuitable coniferous wood for fuel is confined to Himachal Pradesh, the other States with the exception of Jammu & Kashmir which uses 9 per cent of its softwoods for fuel, restricting its use as industrial wood only Of total industrial wood, softwoods form 25 per cent (1,301 000 cu m or 46,463 000 cu ft) and hardwoods 75 per cent (3,882,000 cu m or 138,635,000 cu ft) Of total fuelwood, only 3 per cent (343,000 cu m or 12,257,000 cu ft) is softwood and the balance (10,693 000 cu m or 381,910,000 c ft) hardwood

The removals work out to 14 cu m (512 cu ft) of industrial wood and 31 cu m (1,091 cu ft) of fuel wood per 1,000 inhabitants The corresponding figures for Asia are 63 cu m and 112 cu m respectively and for the world, 324 cu m and 268 cu m respectively

India's removals are thus rather low This must be attributed to the rather high density of population, the relatively large extent of inaccessible forests and the over-all low productivity of large tracts of accessible forests The immediate aim is to reduce the inaccessible area by extending communications and to improve the productivity of all forests, particularly the depleted areas, by appropriate silvicultural methods

Out-turn of Minor Forest Products

The minor forest products of India which are commercially important are bamboos and canes, fodder and grazing, gums, resins, lac, grasses other than fodder grasses and products which are of use in perfumery or medicine During the year 1958-59, according to data furnished by States, the value of the total output of minor forest products was estimated at Rs 98 millions, out of which the share of the above categories of products was Rs 56 millions (57 per cent) The corresponding figures for 1953-54 were 99 8 millions and 39 2 millions (39 per cent) respectively

It must be remarked that the value of the output of the minor forest products furnished above represents the seigniorage value of the minor forest products (at site in the forest, before they are harvested) Owing to the scattered occurrence of the products, not only is the cost of collection high, but also the cost of transport from the forest to the rail head or other centres with motor transport facilities Hence by the time it reaches the wholesale markets, the costs have increased about 10 times or more including handling charges of contractors and merchants On this assumption the value of the total out-put of minor

forest products would come to over Rs 100 crores (Rs 1,000 millions) It is worthy of mention here that out of this total, products of the value of Rs 92 crores (Rs 920 millions) are utilised for internal consumption

Four of the above products, namely, lac, myrabolans, gum karaya and *beedi* leaves, occupy positions of considerable importance in India's external trade During 1959, shellac and other forms of lac were exported to the tune of Rs 36 7 crores (Rs 367 millions) Production of lac could be increased very considerably Synthetic resins, although costlier, have come into limited use in recent times and are replacing lac for electrical insulations

As India has a virtual monopoly in lac, it is of vital importance that shellac should not lose ground to synthetic substitutes During 1959, myrabolans, both whole and crushed, were exported to the extent of 250,000 quintals (492 cwt) valued at Rs 41 lakhs (Rs 4 1 millions) The gum of *Sterculia urens* (gum karaya) is exported to the extent of Rs 87 lakhs (Rs 8 7 millions) while *beedi* leaves (*Diospyros melanoxylon*) are exported to the tune of Rs 11b lakhs (Rs 11 8 millions)

The chief classes of items of minor forest products, together with the value of the output as recorded for 1958-59, are furnished below —

TABLE No 5

Out-turn of Minor Forest Products in 1958-59

Serial No	Class of Products	Value of out turn (1958 59)
1	Animal products	3
2	Bamboos and canes	182
3	Drugs and spices	12
4	Fibres and flosses	small
5	Fodder and grazing	109
6	Grasses other than grazing	33
7	Gums, resin and lac	152
8	Rubber and latex	small
9	Incense, perfume woods	84
10	Tanstuff and Dye stuff	24
11	Vegetable and oil seeds	6
12	Other minor forest products	376
	Total	981

Grazing in Forests

India being still largely an agricultural country, the importance of live-stock in the national economy needs no emphasis According to the census of 1956, India possesses 302 millions of cattle excluding pigs of which 34 8 millions or 11 5 per cent obtained grazing in the forests With a geographical area which is only 2 2 per cent of that of the world and a population which is 13 per cent of that of the world, India has 19 per cent of the world's cattle, 50 per cent of the world's buffaloes and 18 per cent of the goats The annual contribution from live-stock to the national income is about Rs 1,000 crores (Rs 10,000 millions) forming about 10 per cent of the total The Table below furnishes an abstract of the various classes of animals which grazed in the forests during 1957-58

TABLE No 6

Abstract of Live-stock that grazed in Forests

Serial No	Kind of animal	Total population as per 1956 census	Animals grazed in forests in 1957-58	Percentage of total population of each kind grazed in forests	Remarks
1	2	3	4	5	6
1	Buffaloes	44,915,758	4,302,872	9 6	
2	Cows and bullocks	158,650,624	17,133,081	10 8	
3	Sheep	39,246,248	12,578,833	13 3	Separate data of sheep and goats grazed in forests are not available
4	Goats	55,405,490			
5	Camels	775,680	146,300	18 9	
6	Other animals excluding pigs, viz, horses, ponies, mules and donkeys	2,641,926	673,020	25 4	Pig are not grazed in forests and are omitted here
	Total	301,635,726	34,834,106	11 5	

Converted into equivalent cattle (i e cow) units at the rate of 2 sheep for 1 cattle unit, ½ buffalo for 1 cattle unit and 1/8 camel for 1 cattle unit, the total number of animals that grazed works out to 38 9 million cattle units Based on the total forest area this works out to an average grazing incidence of 2,316 ha (5,724 acres) per cow unit As an incidence of 1 6 ha (4 acres) per cow unit is considered ordinarily adequate, the over-all position would appear to be satisfactory However, when we consider that large areas of forests are not available to grazing on account of inaccessibility, absence of palatable grasses, or closure due

to administrative or silvicultural reasons, this is far from being the case Control and ameliorative measures such as levy of appropriate grazing fees, periodic and rotational closures, penning of cattle in the interior regions and improvement of the stocking of palatable grasses are some of the measures which are being attempted with varying degrees of success in different States

As only 11 5 per cent of the total live-stock population get their grazing in the forests, a very large majority necessarily has to subsist on dried stalks of agricultural crops and crop residues Annual production of green grass, raised with irrigation, is very small, being limited to municipal sewage farms and scattered areas managed under farm forestry conditions Taking both the areas under agriculture and the areas under forests into account, with reference to the total heads of livestock, fodder supplies would appear to be very inadequate in the States of Bihar, Madras, Uttar Pradesh and West Bengal

Working Plans

A working plan may be defined as a written scheme of management aiming at continuity of policy and action and controlling the treatment of a forest It usually covers a divisional charge of 500 to 2,500 sq km (200 to 1,000 sq miles) Good working plans are essential to sound forest management The progress made in the preparation of working plans is one of the chief accomplishments during a century of systematic administration Out of nearly 783,962 sq km (302,688 sq miles) of forests, 363,830 sq km (140,475 sq miles) or 46 4 per cent are now under well-organised working plans Control, namely, the check that sanctioned working plans are actually carried out, has also greatly improved in recent years

A good deal of the back log in respect of working plans is on account of the erstwhile private forests which have been taken over for management by the various State Governments, the difficulties being enhanced by litigation, lack of proper records, maps, etc

Revenue and Expenditure

During the year 1959-60 the total revenue of Forest Departments in both the States and the Union Territories, stood at Rs 537 millions as against only Rs 163 millions in 1948-49 The rapid rise in the gross revenue is due to increased demand for forest products both for domestic consumption and for use in forest industries, as well as, partly, to increase in the prices of forest products During 1959-60, the amounts of Rs 184 millions and Rs 58 millions were expended on "Normal" and "Plan & Development" budgets respectively The surplus of revenue over normal expenditure was Rs 353 millions and that over normal and development expenditure was Rs 295 millions The corresponding figures for 1948-49 were Rs 75 millions and 88 millions respectively. The phenomenal rise in gross revenue, expenditure and surplus is very well brought out by the histograms at pages 155 to 163

The surplus of revenue over normal and development expenditure works out to 55 per cent of the gross revenue for India as a whole The revenue per unit of area averages Rs 685 per sq km (Rs 1,733 per sq mile) The expenditure works out to Rs 234 per sq km (Rs 607 per sq mile) and Rs 74 per sq km (Rs 191 per sq mile) respectively for normal and development expenditure The surplus works out to Rs 450 per sq km (Rs 1,167 per sq mile) if development expenditure is left out, and to Rs 377 per sq km (Rs 975 per sq mile) if this is also included

Reviewing the progress of revenue, expenditure and net surplus for India as a whole from the triennium 1936-39 up to date, one is struck by the phenomenal rise in all these figures The average for the triennium 1936-37 to 1938-39 represents the conditions prior to the Second World War The War gave a remarkable impetus to the extraction and utilization of forest products The gross revenue, expenditure and surplus jumped from 2 6, 1 9 and 0 7 crores respectively prior to the War to 16 3, 7 5 and 8 8 crores in 1948-49 Due to increased encouragement given to forest industries, improved standard of living of the masses on account of Independence and the rising level of prices of all commodities, the net surplus of Forest Departments continued to rise rapidly, and reached Rs 29 5 crores in 1959-60 This increase, it must be stated, is all the more remarkable in view of the fact that, with the partition of the country in 1947, part of the forests has gone to the new country of Pakistan

There are cases of supplies of timber by the Forest Departments to other Departments of State Government or the Union Government on negotiated prices Timber and other forest products are also supplied to plywood, match and similar industries at non-competitive prices Leases of bamboos of fairly long duration, up to 30 years, are given to paper mills at low prices to encourage the industry For the benefit of local population, grazing in State forests is offered to the public at very low rates These and similar factors conspire to depress the gross forest revenue in a substantial measure

Another factor which deserves mention in this context is that large quantities of forest products are removed by right-holders, free grantees and others privileged to remove produce at concessional rates But no credit appears for these items in the financial statement The real contribution of the Forest Departments to the gross revenues is therefore much greater than what meets the eye at first sight

National Income from Forestry Sector

The national income from the forestry sector for the year 1958-59, based on the data furnished in this volume, comes to Rs 176 crores as per details below —

TABLE No 7

	Lakhs cu m (Lakhs cu ft)	Price per cu m (cu ft)	Value Lakhs of Rs
Timber—Recorded	51 481 (1,818)		
Unrecorded	15 687 (554)	173 82 (4 922)	
Total	67 168 (2,372)		11,700
Fuel—Recorded	117 033 (4,133)		
Unrecorded	13 507 (477)		
Total	130 540 (4,610)	19 988 (0 566)	2,600
Total timber and fuel			14,300
Minor Forest Products at 10 times the gross revenue derived by Forest Departments for the seigniorage value of the products (before harvesting *in situ* in the forests) Rs 1,053 lakhs × 4			4,212
Total all products			18,512
Less 5% for cost deductions			926
Total net income			17,586

The ratio of the national income from the forestry sector to the gross revenue of forest departments varies from 4 50 (1954-55) to 4 30 (1955-56), 3 58 (1956-57) and 3 87 (1957-58) For rough calculation of the national income, the ratio may be taken as 4.

Adopting figures worked out by the Central Statistical Organization for the years 1948-49 to 1953-54 (old figures probably not so reliable), figures compiled by the Central Statistical Organisation for the years 1954-55 to 1956-57 (revised calculation somewhat more accurate) and figures worked out at the Forest Research Institute for the years 1948-49 to 1959-60, on the basis of the ratio worked out above, the following table shows that the contribution of the forestry sector to the national income is about 1 5 per cent in recent years As the percentage of the total working force of the country engaged in forestry is only 0 2 per cent (India 1961) this contribution is highly commendable

TABLE No 8

Total National Income and Income from Forestry Sector

(See detailed Table in Appendix)

Values in crores of Rupees except where otherwise stated

Year	Total National Income at 1948 49 prices	Income per capita at 1948 49 prices (Rs)	Income from Forestry Sector	Gross Revenue of Forest Departments in India	Income from Forestry Sector F R I 's figures Col 5 × 4	Percentage of income from Forestry to total National Income Col 6 — Col 2 × 100
1	2	3	4	5	6	7
1948 49	8,650	247	60	16 25	65	0 8
1950 51	8,860	246	70	23 6	95	1 1
1952 53	9,460	257	70	23	92	1 0
1955-56	10,480	274	134	31	124	1 2
1956 57	11,000	284	140	38 25	153	1 4
1957-58	10,830	276		40 8	163	1 5
1958-59	NA	NA		50	200	
1959-60				53 7	215	

NOTES 1 Column 4 Figures from 1949 50 to 1953 54 abstracted from "India 1961" Figures from 1954 55 to 1956 57 are preliminary figures prepared by Central Statistical Organisation.

2. Figures in Column 6 are obtained by multiplying corresponding figures in column 5 by four

The above figures disclose a rise in the national income from the forestry sector of 36 per cent over a five-year period from 1955-56 at the end of the First Plan The percentage increase during the first four years of the Second Plan period is 73 per cent or an annual increase of 18 per cent, which is remarkable

Foreign Trade in Forest Products

Import and Export of Wood Products—During the year 1959, India imported wood worth Rs 514 lakhs (Rs 51 4 millions) and wood products worth Rs 1,707 lakhs (Rs 170 7 millions) The exports for these items stood at Rs 21 4 millions and Rs 10 2 millions respectively The net imports amounted to Rs 30 millions of wood and Rs 160 5 millions of wood products (chiefly pulp, paper and paper products) The following Table furnishes the data under a few major classes —

TABLE No 9

Imports, Exports and Net Imports of Major Forest Products during 1958 *and* 1959

(In lakhs of Rupees)

Code No	Class of produce	For year 1958			For year 1959		
		Imports	Exports	Net imports (+) or exports (—)	Imports	Exports	Net imports (+) or exports (—)
24	Wood, lumber & cork	263	178	85	514	214	300
25	Pulp & waste paper	382		382	695		695
63	Wood and cork manufactures	56	15	41	43	12	31
64	Paper-board & manufactures thereof	826	73	753	967	71	896
821	Wood, furniture & fixture	1	22	(—)21	2	19	(—)17
	Total	1,528	288	1,240	2,221	316	1,905

Import and Export of Minor Forest Products—During the same year 1959, India Imported minor forest products of the value of Rs 225 lakhs, the chief items being —

76,000 quintals (150,000 cwt)	wattle bark	Rs 35 lakhs
44,000 quintals (87,000 cwt)	gum arabic	Rs 82 lakhs
53,000 quintals (104,000 cwt)	other gums and resins	Rs 71 lakhs.

Exports during the year stood at over Rs 960 lakhs, the main items being —

250,000 quintals (492,000 cwt)	crushed and whole myrabolans	Rs 41 lakhs
133,000 quintals (262,000 cwt)	gum karaya (from *Sterculia urens*) and other gums	Rs 172 lakhs
151,000 quintals (297,000 cwt)	shellac & other forms of lac	Rs 367 lakhs
61,000 quintals (120,000 cwt)	vegetable plaiting materials including canes and rattans	Rs 25 lakhs
93,000 quintals (184,000 cwt)	*Beedi* leaves (from *Diospyros melano xylon*)	Rs 118 lakhs
83,000 kg (184000 lb)	Sandal wood oil	Rs 98 lakhs

The following statement furnishes the abstract of the import, export and net import under a few major classes During 1959 there was a net export of minor forest products of the value of Rs 677 lakhs The chief items in this favourable balance of trade were gums and resins with a net export of Rs 77 lakhs shellac and other forms of lac with a net export of Rs 367 lakhs, materials used in medicine or perfumery which accounted for Rs 126 lakhs and sandalwood oil Rs 98 lakhs

TABLE No 10

Abstract of Imports and Exports of Minor Forest Products during 1959

(In lakhs of Rupees)

Code No	Description of produce	Import	Export	Net import (+) export (—)
292 01	Vegetable products used in dyeing and tanning	43	63	—20
292 02	Natural gums, resins and balsams	107	178	—77
	Shellac and other forms of lac		367	—367
	Resins	46	17	+29
	Vegetable plaiting materials including canes and rattans	1	25	—24
	Vegetable products used in medicine or perfumery	29	155	—126
55-0134	Sandal wood oil		98	98
	Total for minor forest products	226	903	—677

Abstract of Foreign Trade in 1959—On the whole India is an importing country as regards forest products During the calendar year 1959, the value of imports of forest products

amounted to Rs 244 6 millions, of which wood and timber accounted for Rs 51 4 millions, wood products for Rs 170 7 millions and minor forest products for Rs 22 5 millions During the same year, she exported products worth Rs 112 1 millions, of which wood and timber accounted for Rs 21 4 millions, wood products for Rs 10 2 millions, and minor forest products for Rs 80 5 millions The net imports consisted of Rs 30 0 millions of wood and timber and Rs 160 5 millions of wood products, partly offset by net exports of Rs 58 0 millions of minor forest products Reviewing the foreign trade from a different angle, it is seen that India imported Rs 73 9 millions worth of raw materials and Rs 170 7 millions worth of manufactured products against an export of Rs 101 9 millions and Rs 10 2 millions respectively There is thus a net import of Rs 160 5 millions worth of manufactured products, offset somewhat by net export of Rs 28 0 millions of raw materials, resulting in the overall import of Rs 132 5 millions The import of manufactured products forms 70 per cent of total imports, the export of the raw materials forms 91 per cent of the total exports The need for large-scale industrialization based on forest products is thus apparent

TABLE No 11

Imports, Exports and Net Imports of Forest Products in 1958 and 1959

(In lakhs of rupees)

Class of product	For year 1958			For year 1959		
	Import	Export	Net	Import	Export	Net
Major forest products	1,528	288	1 240	2,221	316	1,905
Minor forest products				225	805	—580
Total				2,446	1,121	1,325

Regeneration and Afforestation

Regeneration and Afforestation are an essential part of forestry in any country These are particularly important in regions where, as during the Second World War, over-felling had taken place, or where uncontrolled destruction had occurred in the past due to shifting cultivation, fires and other abuses Up to 1958-59 (as per data received from States for Hand-book of Indian Forest Statistics), the afforestation activities were spread over an area of 486,700 ha (1,202,617 acres) or 4,867 sq km (1,879 sq miles) During the next five years of the Third Five-Year Plan, very large areas are proposed to be regenerated As regards normal regeneration both natural and artificial, 9 8 million ha (24 millions of acres) were under natural regeneration, 0 6 million ha (1 5 millions of acres) under artificial regeneration with a total of 10 4 millions ha (25 5 millions of acres) in all This works out to 13 per cent of the total forest area of the country

Organization of Forest Administration

'Forests' constitute a State subject The Government of India, however, are responsible for forest research and forest education In view of the fact that the protective influences of forests or deleterious results of deforestation extend far beyond the frontiers of individual States and in view of the large requirements of wood and wood products for industrial development, transport and communications and for defence purposes, the Central Government has also given special attention to the initiation of policy, so that the local pressures may not militate against the wider interests of the nation The National Forest Policy was enunciated in the Government of India Resolution May 1952

The Ministry of Agriculture in the Government of India co-ordinates forest activities in the country, but no forests are directly under its administrative control, except 29,412 sq km (11,356 sq miles), i e, about 3 8 per cent of the total forest area, lying in the Union territories of (1) Andaman and Nicobar Islands, (2) Delhi, (3) Himachal Pradesh, (4) Manipur and (5) Tripura The Inspector-General of Forests is their technical adviser in forest matters

All States have separate Forest Departments, headed usually by a Chief Conservator of Forests For purposes of administration the States are divided into one or more forest Circles, each in charge of a Conservator of Forests The mean area of a circle is 11,500 sq km (4,400 sq miles)

Each Circle, in turn, is divided into several Divisions, normally 5 to 7, each under a Divisional Forest Officer (called also 'District Forest Officer' in some States) The ultimate unit of administration is the Division The mean area of a Division is 1,878 sq km (725 sq miles) There are about 5 Ranges in a Division A Division may be co-extensive with the Civil District, more frequently it is larger or smaller, depending on the importance of the forests contained and intensity of administration and working proposed therein

Each Division is sub-divided into several Ranges, each in charge of a Forest Range Officer. The Range constitutes the unit for execution of forest

works, including felling, removal and sale of forest produce It may be truly called the backbone of forest organisation The extent of Ranges in a Division varies from 130 sq km (50 sq miles) to 670 sq km (250 sq miles) in the different States, the average for all-India being 403 sq km (156 sq miles) The number of Ranges in a Division is about 5

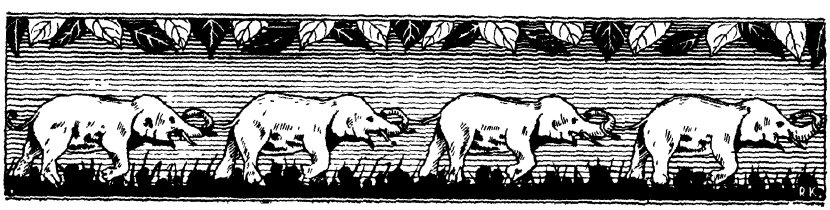
From the point of view of protection of the forests from illicit felling and other abuses as well as for purposes of more efficient supervision of fellings, cultural operations, maintenance of boundaries, roads, buildings, etc, each Range is divided into several Beats, each manned by a Forester (Beat Officer) and/or one or more Forest Guards One Beat ordinarily comprises about 37 sq km (15 sq miles) of forest It ranges from an average of 12 sq km (5 sq miles) in Punjab to an average of 220 sq km (87 sq miles) in Assam The all-india average is 37 sq km (15 sq miles)

It is, however, to be noted that the averages mentioned above are high, because the total areas (for India or for individual States) include large extents of poorly staffed and poorly maintained forests and that the areas of particular Circles Divisions, Ranges or Beats which are intensively managed can be very much less, e g, an individual Circle may be only 3,000 sq km (1,200 sq miles), or a Division 250 sq km (100 sq miles), etc, or sometimes even less



"The man planting trees by the wayside will enjoy bliss in heaven for as many years as there are fruits and flowers and leaves in what he planted"

—Padma Purana



GLOSSARY OF LOCAL AND TECHNICAL TERMS

Ashram—Hermitage

Ashoka—*Saraca indica* (or *Polyalthia longifolia*)

Banyan—*Ficus religiosa*

Bel—*Aegle marmelos*

Bhabar—A gently sloping tract at the foot of hills, composed of boulder and gravel deposits

Babul—*Acacia arabica*

Cho—A dry stream of sand and stone

Counterfire (*to*)—An attempt to extinguish an advancing forest fire by deliberately burning the forest from the opposite direction

Chital—Spotted deer

Crore—Indian term for the number 10 000,000

Cypress—*Cupressus torulosa*

Champ—*Michelia champaca*

Duree—A carpet

Fir—Silver fir One of three species in India —

(1) *Abies pindrow*

(2) *Abies spectabilis*

(3) *Abies densa*

Forest, Panchayat—Any forest whose management is vested in a village panchayat (i e , a body of men elected by the villagers from among themselves for specific administrative or other purposes pertaining to the village)

Forest, Village—(a) A state forest assigned to a village community under the provisions of the Indian Forest Act (b) A forest established and managed for the supply of forest produce to a village

Forest, Communal—A forest owned and generally managed by a community such as a village, town, tribal authority or local government, the members of which share in the produce or proceeds Syn *Community forests*

Forest, Protected—A legal term for an area subject to limited degree of protection under the provisions of Chapter IV of the Indian Forest Act

Forest, Reserved—An area so constituted under the Indian Forest Act or other forest law

Gamari—*Gmelina arborea*

Gond—Swamp deer

Hemlock—The Himalayan spruce, *Tsuga brunoniana*

Kadamba—*Anthocephalus cadamba*

Lakh—Indian term for the number 100,000

Neem—*Azadirachta indica*

Nistar—Forest produce required for household and agricultural purposes

Semul (*Simul* or *semal*)—Wild silk-cotton tree, *Salmalia malabarica*

Shola—A Tamil word for evergreen vegetation For purposes of classification of forest types, the term is applied to the montane temperate wet evergreen forests of Nilgiris, Anamalais and Palnis of South India

Shuldari—A small handy tent

Sisham—*Dalbergia sissoo*

Spruce—*Picea smithiana*

Tulsi—*Ocimum sanctum*

Tarai (*Terai*)—A water-logged alluvial plain below the *bhabar* with a gentle southerly slope

Taungya—Burmese word for shifting cultivation The term is now applied to the method of raising forest plantations in combination with field crops, otherwise known as *Agri-silvi* method or *agri-silviculture* and to the plantations themselves

Working Plan—A written scheme of management aiming at continuity of policy and action and controlling the treatment of a forest The instrument of forest management

Yew—*Taxus baccata*

*

APPENDIX I

List of Officers who have served as Inspectors-General of Forests, Presidents of Forest Research Institute and Colleges and heads of Forest Departments of States and Union Territories.

I—Inspectors-General of Forests

Period	Name
1864—81	Dietrich Brandis
1881—85	William Schlich
1885—1900	B Ribbentrop
1900—02	H C Hill
1902—03	R C Wroughton
1903—08	S Eardley Wilmot
1908—13	F B Bryant
1913—21	G S Hart
1921—26	P H Clutterbuck
1926—30	A Rodger
1930—33	A D Blascheck
1933—37	C G Trevor
1937—40	L Mason
1940—44	S H Howard
1944—49	A P F Hamilton
1949—54	M D Chaturvedi
1954—56	C R Ranganathan
1956—59	G G Takle
1960—	V S Rao

II—Presidents of Forest Research Institute and Colleges

Period	Name
1906—08	S Eardley Wilmot*
1908—09	L Mercer†
1909—09	A M F Caccia
1909—13	L Mercer
1913—13	R S Hole
1913—16	L Mercer
1916—19	B B Osmaston
1919—20	W F Perree
1920—20	R C Milward
1920—23	W F Perree
1923—23	W Mayes
1923—25	W F Peree
1925—26	A Rodger
1926—27	A Rodger*
1927—27	H Tireman*
1927—30	A Rodger*
1930—33	A D Blascheck*
1933—37	C G Trevor*
1937—40	L Mason*
1940—44	S H Howard*
1944—45	C E Simmons
1945—47	D Stewart
1947—54	C R Ranganathan
1954—57	K L Aggarwal
1957—60	R N Datta
1961—	K P Sagreiya

NOTE —*President, Forest Research Institute, in addition to being Inspector-General of Forests

†President, Forest Research Institute, and also Principal, Forest College



III—Heads of Forest Departments of States

(i) *Andhra Pradesh*—The present Andhra Pradesh came into being in November 1956 and includes the Telangana region of former Hyderabad State and the Andhra region of former Madras Presidency

The succession list of composite Madras Presidency will be found under the "Madras State Forest Department"

Period	Name	Period	Name
	Hyderabad		*Andhra*
	Byramji Maneckji		(from April, 1953)
	Burjarji Maneckji	1953—56	N D Sahni
	Palmer		*Andhra Pradesh*
	R S Dobbs	1956—60	Rai Daulat Rai
	Capt Catenia	1960	M P Cariappa
	J Ballantine		
	W F Biscol		
	Sohrabji Byramji		
	E A Patridge		
1914	F A Lodge		
	Nawab Hamid Yar Jung		
1939—44	Mirza Mohammed Ali Baig,		
1944—48	S A Vahid		
1948—50	Gulam Mohiuddin, Director of Forests		

(ii) *Assam*—The head of the Forest Department was designated as Conservator in early stages, as Senior Conservator later and as Chief Conservator of Forests with effect from 12th March, 1959

Period	Name
1880—91	Gustav Mann
1891—94	J A Mckee
1894—99	H L Home
1900—02	C G Dingwall Fordyce
1902—06	E S Carr
1906—07	W F L Tottenham
1907—09	M Hill
1909—12	H Carter
1912—15	A V Munro
1915—19	W F L Tottenham
1919—21	A M Blunt
1921—23	F H Todd
1923—25	F Trafford
1925—28	W R Leg Jacol
1928—32	H L Cooper
1932—36	A J W Milroy
1937—43	C G M Mackarness
1943—46	H. P Smith
1946—49	J B Rowntree
1949—60	P D Stracey
1960—to date	M C Jacob

(iii) *Bihar—Conservators of Forests, Bihar and Orissa*

Period	Name
1912—12	H H Forsyth
1912—14	H Carter
1915—18	H H Haines
1918—20	F Trafford
1920—21	D O Witt
1921—22	E R Stevens
1922—25	A R Dicks
1925—29	A J Gibson
1929—33	E Benskin
1933—36	J S Owden
	Conservators of Forests, Bihar
1936—38	J S Owden
1938—48	L R Sabharwal
1948—52	S S Prasad
	Chief Conservators of Forests, Bihar
1952—58	S S Prasad
1958—to date	J N Sinha

(iv) *Gujarat*—Gujarat State was carved out of the erstwhile Bombay State with effect from 1st May, 1960 The Chief Conservator of Forests from that date is Shri Hari Singh.

(v) *Jammu and Kashmir*—The head of the Forest Department was designated as Conservator of Forests till 1st July, 1924 and as Chief Conservator of Forests after that date

Period	Name
1891—1904	J C Mc'Donell
1904—07	A W. Blunt
1907—15	W H Lovegrove
1915—22	B O Coventry
1922—23	Lt Col Thakur Piar Singh
1923—33	H L Wright
1933—44	Sir Peter Clutterbuck
1944—57	Harnam Singh Pathania
1957—59	Ram Lal Khajuria
1959—to date	A A Firdaus

(vi) *Kerala*—(The list of Chief Conservators of Forests of the different units which form the present Kerala State are furnished).

Period	Name
	Travancore State
1890—1909	T E Bourdillon
1909—14	Rama Rao
1914—19	V Subramnia Iyer
1919—22	V Rama Menon
1922—37	R Dhanushkodi Pillai
1937—40	P Raman Pillai
1940—51	T V Venkateswara Iyer

Period	Name
	Cochin State
1835—67	J S A Kohlhoff
1867—80	J H Stevenson
1880—99	J C Kohlhoff
1899—1907	V Alwar Chettiyar
1907—08	E Narayana Menon
1908—12	E H Johnston
1912—29	K Govinda Menon
1929—33	K Raman Menon
1933—43	T Narayana Menon
1943—51	S Venkateswaran

Travancore Cochin State

Period	Name
1951—56	S Venkateswaran
1956—56	N N Menon
	Kerala State
1956—57	E A Lasrado
1957—58	N. N Menon
1958—	M P George

(vii) *Madhya Pradesh*—(a) *Erstwhile Central Provinces and Berar—Madhya Pradesh*

Period	Name
1906—10	A M Reuther
1910—13	G S Hart
1913—14	M Hill
1914—14	P H Clutterbuck
1914—19	M Hill
1919—22	B B Osmaston
1922—26	H. A Farrington
1926—27	D O Witt

(vii) *Madhya Pradesh*—contd.

Period	Name
1927—28	E R Stevens
1928—34	C A Malcolm
1934—35	J Whitehead
1935—37	C F Bell
1937—39	C E C Cox
1939—43	C M Harlow
1943—46	H S George
1946—47	V K Maitland
1947—50	G B Bakshi
1950—54	Lakhpat Rai
1954—56	G G Takle
1956—56	R N Datta

(b) *Reorganised Madhya Pradesh*

Period	Name
1956—57	R N Datta
1957—61	K P Sagreiya
1961—	B R Mishra

(viii) *Maharashtra*—(Chief Conservators of Forests)

1917—20	T R Bell
1920—24	W E Copleston
1924—27	A G Edie
1927—23	E M Hodgson
1928—32	H L Newman
1932—34	P E Aitchison
1934—36	C E L Gilbert
1936—42	A. C Hiley
1942—44	D B Sothers
1944—45	J B T Brooks
1945—47	W C De C Walsh
1947—50	E T C Vas
1950—54	G S Singh
1954—59	J A Singh
1959—	R R Chaudhari

(ix) *Madras*

1919—23	S Cox
1923—27	M H Stainton Tireman
1927—32	R D Richmond
1932—35	A Wimbush
1935—38	T A Whitehead
1938—40	C C Wilson
1940—47	W G Dyson
1947—48	J A Master
1948—53	M Kesavan Unni Nayar
1953—54	V V Subramanian
1954—56	S K. Bassu
1956—58	V S Krishnaswamy
1958—	C A R Bhadran

(x) *Mysore*

1866	Cleghorn
1866—78	Capt G J Ven Semerin
1878—85	(Not available)
1885—95	L Ricketts
1895—99	Col J Campbell Walker
1899—1901	J L Pigot
1902—14	M Muthanna
1914—21	M G Rama Rao
1921—35	B V Ramaiengar
1935—39	M Machaiah
1939—45	C Abdul Jabbar
1945—46	P Krishnaswamy Rao
1946—48	D L Sathe

(x) *Mysore*—contd

Period	Name
1948—57	M A Muthanna
1957—60	K Kadambi
1960—	N S Kaikini

(xi) *Orissa—Conservators of Forests*

1936—36	H. C B Jollya
1936—46	J W Nicholson
1946—47	C M Choudhury

Chief Conservators of Forests, Orissa, from 15th June, 1948

1947—50	C M Choudhury

Directors of Forests from 1950

1950—53	D H. Khan
1953—54	B P Bassu
1954—56	L Rai

Chief Conservators of Forests, Orissa, from 31st July, 1957

1956—60	G M Mathur
1960—	D N Choudhury

(xii) *Punjab*

1947—52	Jhuna Singh
1952—55	N P Mohan
1955—57	Partap Singh
1957—	G S Dhillon

(The succession list of Chief Conservators of Forests from inception of Forest Department to partition of the country in 1947 is not available Some references to officers who served in the Punjab prior to partition are made elsewhere in this volume)

(xiii) *Rajasthan*

1948—49	Nandan Bhargava
1949—51	S C Kothari
1951—52	C M Choudhury
1952—55	S C. Kothari
1955—	N. N. Sen

(xiv) *Uttar Pradesh*

1915—29	P H Clutterbuck
1929	F F R Channer
1929—37	F Canning
1937—40	E A Smythies
1940—	S H Howard
1940—41	W A Baily
1941—48	W T Hall
1948—49	M D Chaturvedi
1949—55	R. N Singh
1955—58	D L. Sah
1958—61	R Sahai
1961—	R. C Soni

(xv) *West Bengal*

Period	Name
1864—70	T Anderson
1870—72	H Leeds
1872—79	W Schlich
1879—82	J S Gamble
1882—90	A L Home
1890—94	E P Dansey
1894—94	H H Davis
1894—1902	A E Wild
1902—03	J H Lace
1903—08	A L Mcintire
1908—10	G S Hart
1910—13	C E Muriel
1913—14	H A Farrington
1914—16	C E Muriel
1916—21	H A Farrington
1921—24	R C Milward
1924—35	E O Shebbeare
1935—41	W Meiklejohn
1941—45	T M Coffey
	Chief Conservators
1945—46	T M Coffey
1946—48	S J Curtis
	Director of Forests
1948—50	S Chaudhuri
	Conservators General of Forests
1950—53	S Chaudhuri
1953—56	N Pal
1956—56	J C Nath
1956—60	V S Rao
1960—	K L Lahiri

IV—*Heads of Forest Departments in Union Territories*

(i) *Andamans and Nicobar Islands*—The post was designated as Chief Forest Officer from the beginning up to 9th November, 1948 (except for the period from 7th October, 1945 to 5th November, 1946 when it was up-graded to that of a Conservator) Since 10th November, 1948, the post is designated as Chief Conservator of Forests

1919—21	W R Leg Jacob
1921—24	J W Bradely
1924—27	L Mason

(i) *Andamans and Nicobar Islands*—conta

Period	Name
1927—28	M C C Bonington
1928—29	L Mason
1929—31	G H A Golding
1931—32	A K Glasson
1932—33	W E Fleweet
1933—34	A K Glasson
1934—35	W E Fleweet
935—42	E L P Foster
1942—45	Japanese occupation
1945—48	E L P Foster
1948—49	M S Balasubramaniam
1949—52	S K Bassu
1952—55	J Banerji
1955—60	M M Srinivasan

(ii) *Himachal Pradesh*—The State was first formed in 1948, since its inception the head of the Forest Department is designated as Chief Conservator of Forests

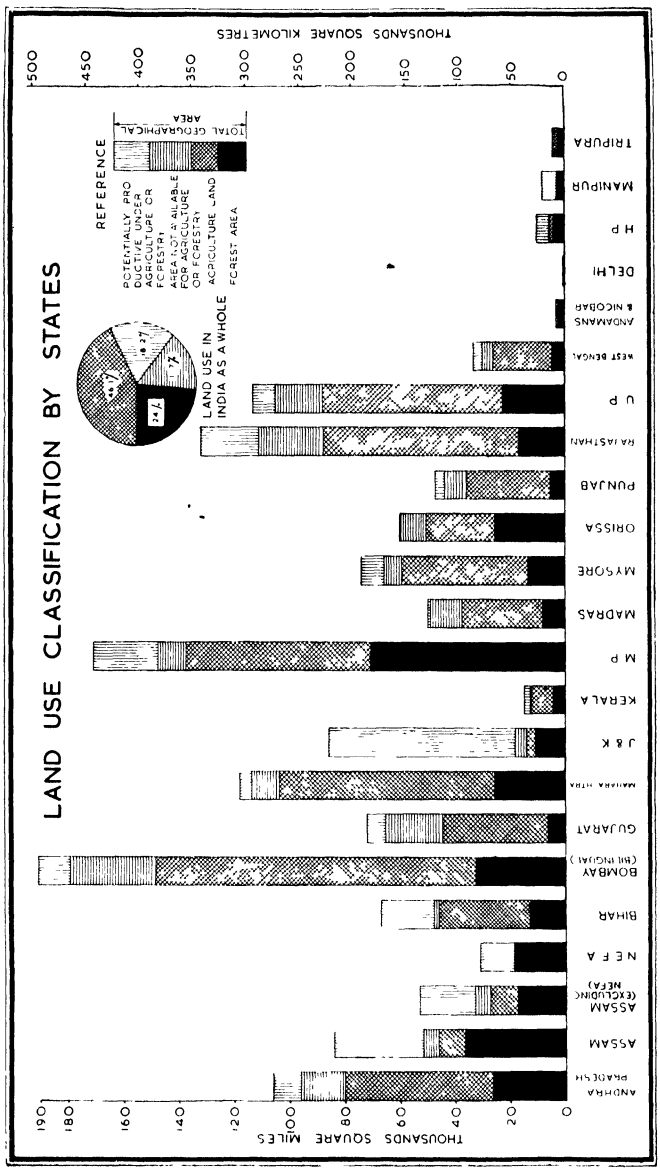
1948—52	N P Mohan
1953—54	I N Sewal
1954—57	G S Singh
1957—60	D C Kaith
1960—	V P Aggarwal

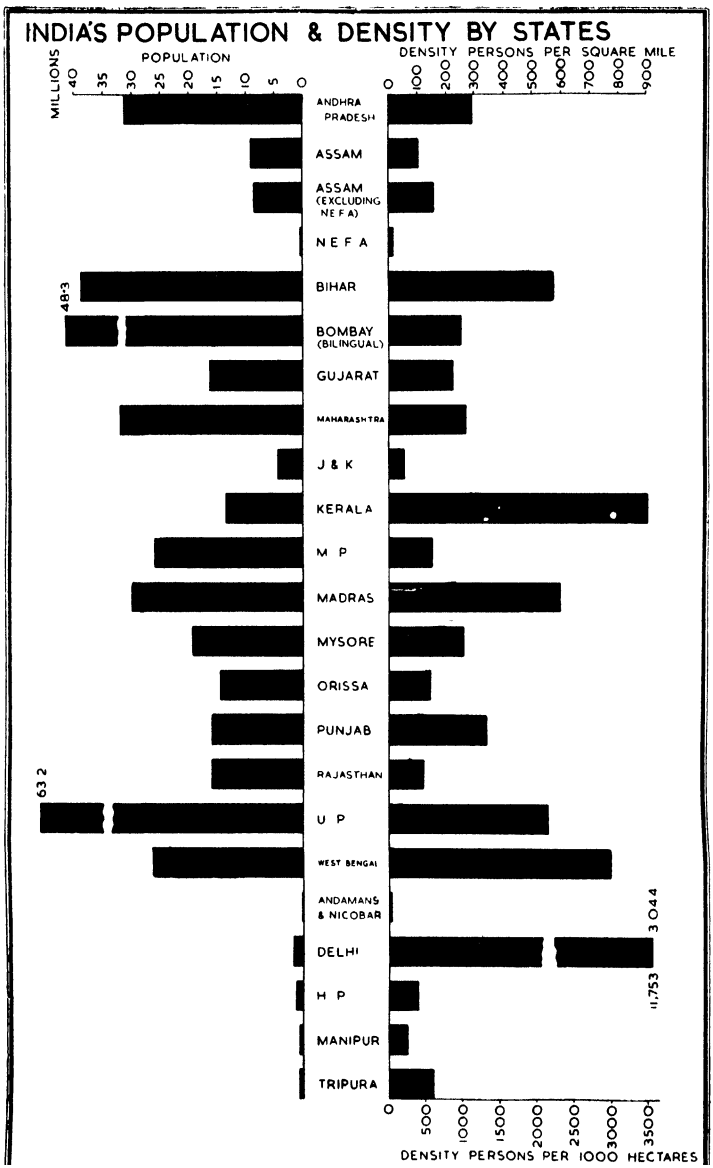
(iii) *Manipur*—The post was designated as Forest Officer up to 17th December, 1956 and as Chief Forest Officer thereafter

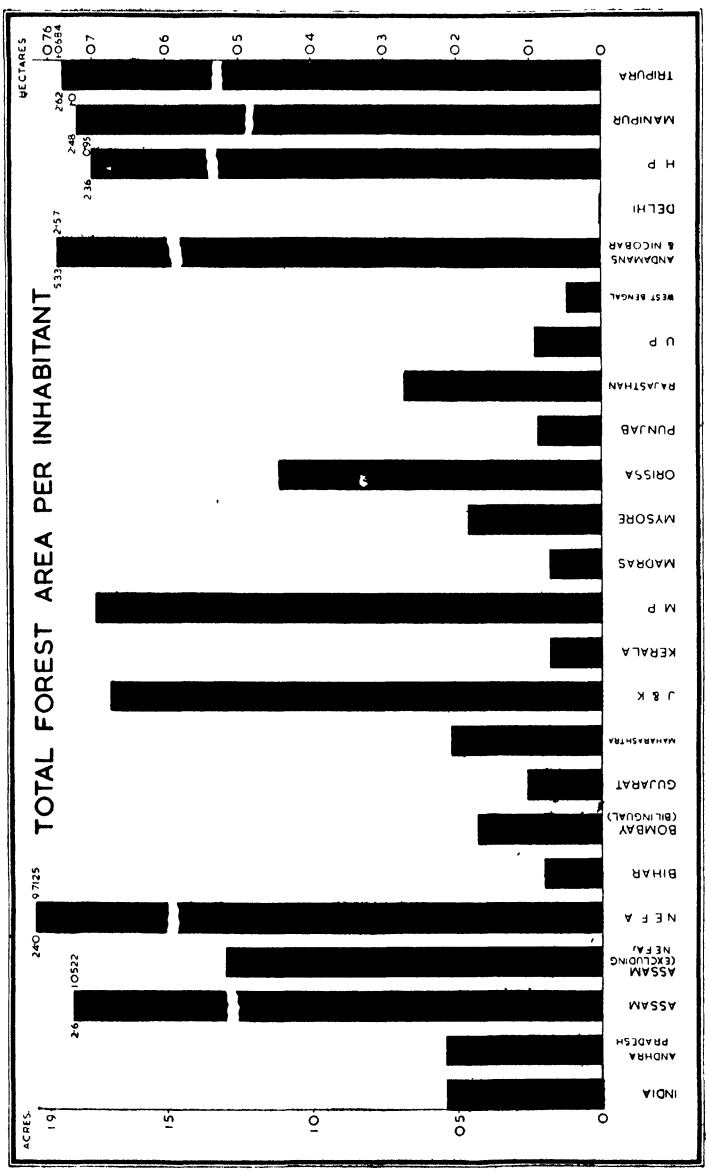
1931—35	D C Kaith
1935—36	Hari Singh
1936—40	C Padmanabh
1940—42	K V Reddy
1942—	R K Bijoychandra Singh

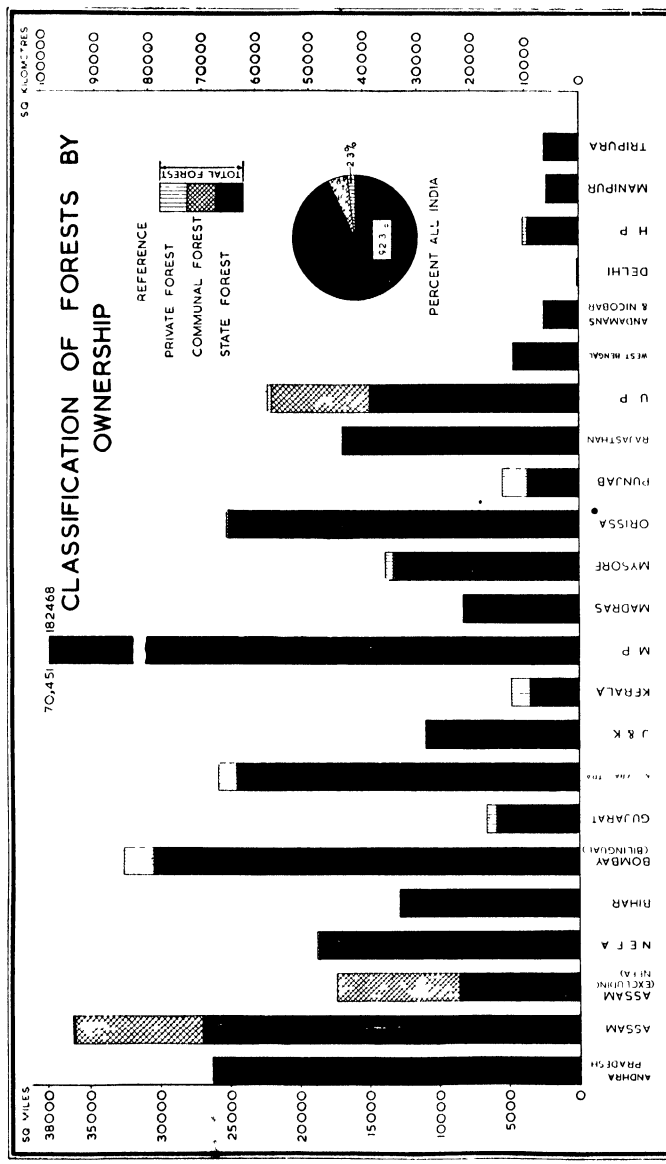
(iv) *Tripura*—Prior to 1942, the Forest Department was under the control of a Naib Dewan The post is designated as "Forest Officer"

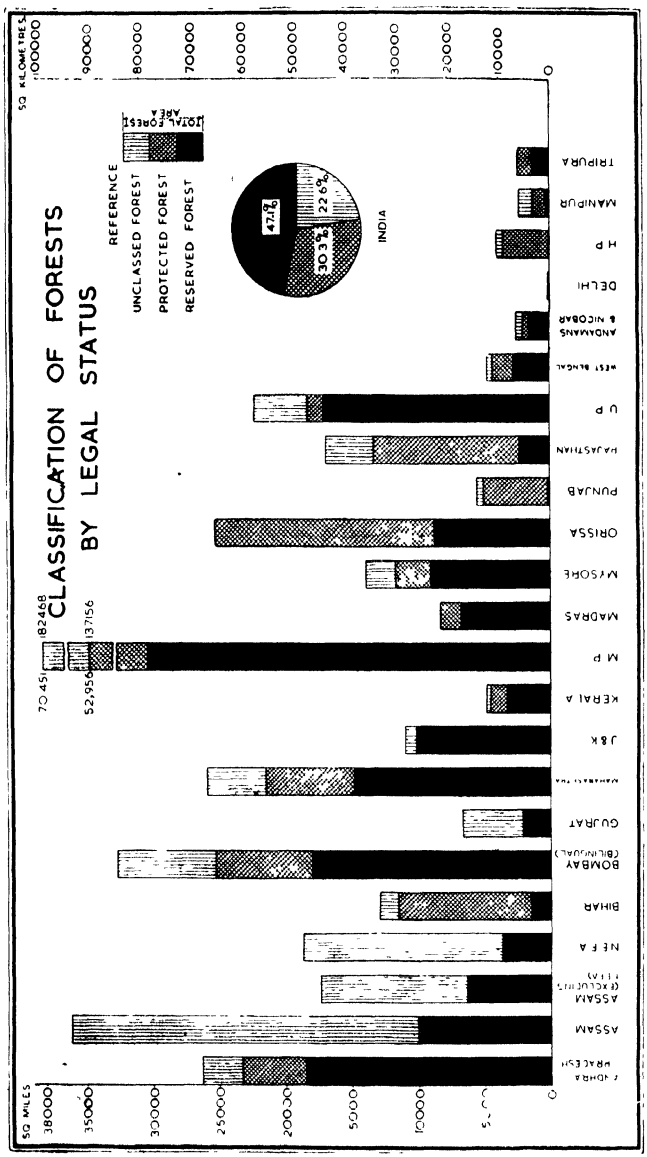
1942—45	N L Dev Varma
1946—52	S K Dutt
1952—54	N C Bhattacharjee
1954—56	R C Dutt
1956—	N C Bhattacharjee

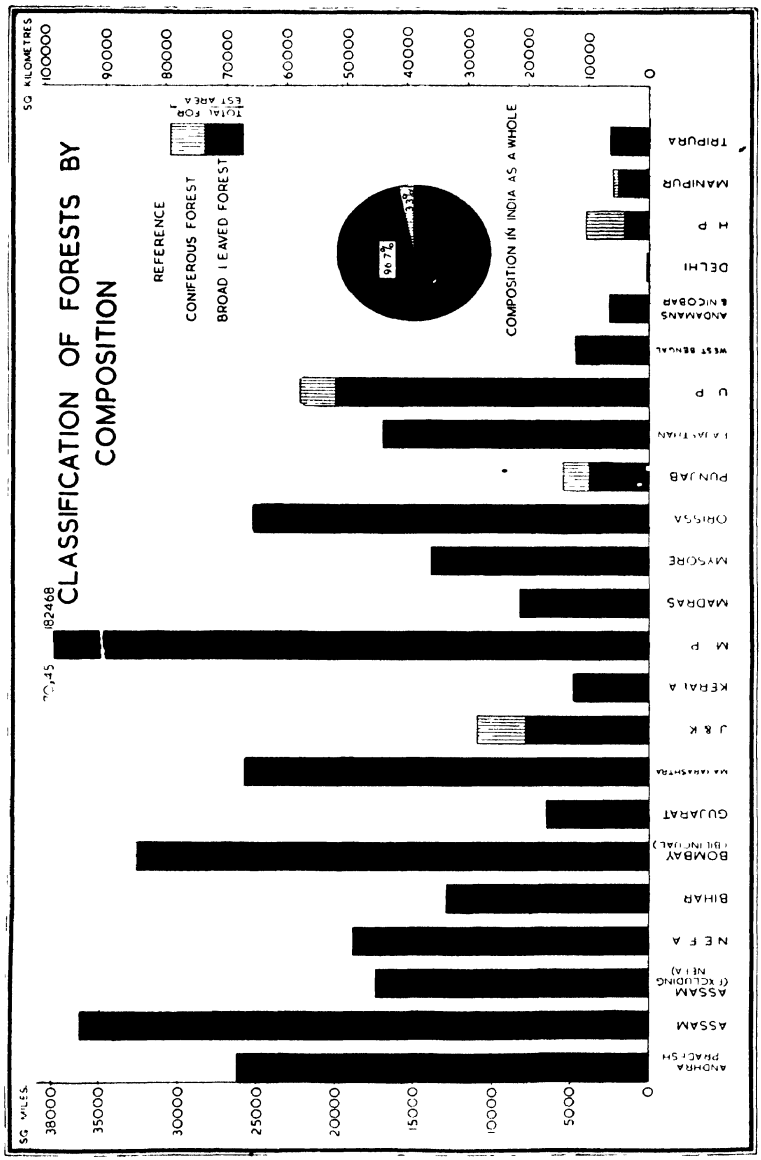

LAND USE CLASSIFICATION BY STATES
THOUSANDS SQUARE MILES
THOUSANDS SQUARE KILOMETRES
ANDHRA PRADESH
ASSAM
ASSAM (EXCLUDING NEFA)
N E F A
BIHAR
BOMBAY (MAHARASHTRA)
GUJARAT
MAHARASHTRA
J & K
KERALA
M P
MADRAS
MYSORE
ORISSA
PUNJAB
RAJASTHAN
U P
WEST BENGAL
ANDAMANS & NICOBAR
DELHI
H P
MANIPUR
TRIPURA
REFERENCE
TOTAL GEOGRAPHICAL AREA
POTENTIALLY PRODUCTIVE UNDER AGRICULTURE OR FORESTRY
AREA NOT AVAILABLE FOR AGRICULTURE OR FORESTRY
AGRICULTURE LAND
FOREST AREA
LAND USE IN INDIA AS A WHOLE
24%
27%
17%
27%

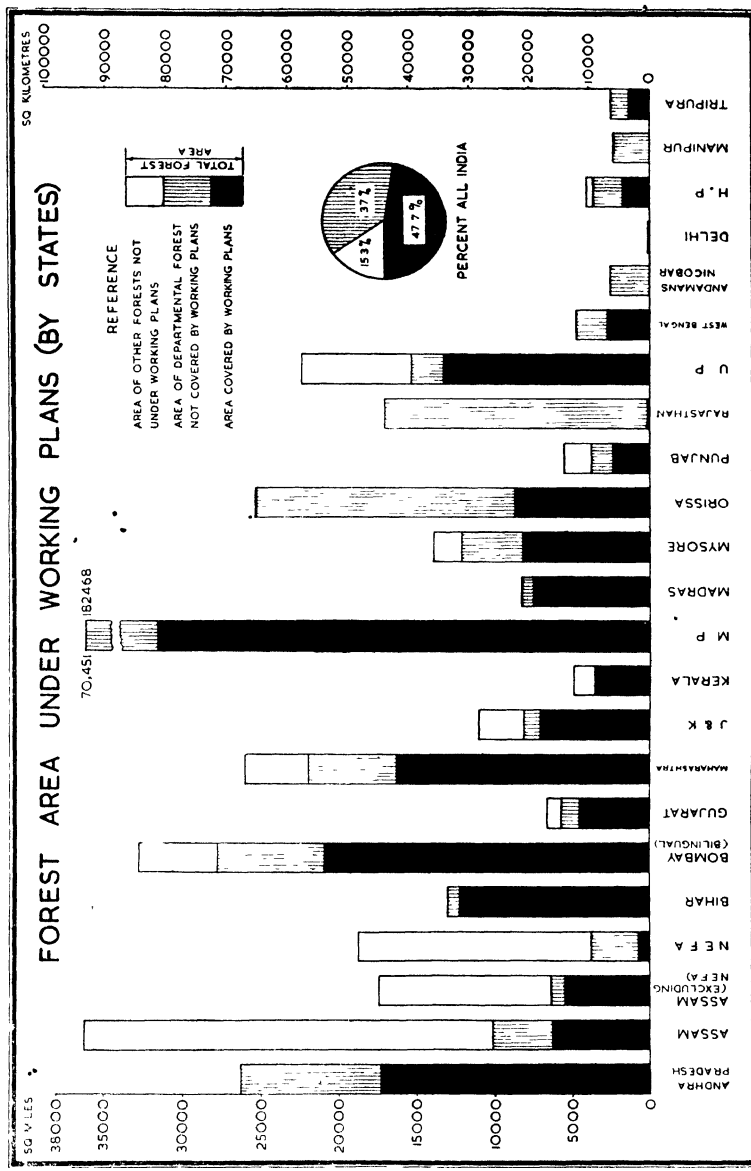

INDIA'S POPULATION & DENSITY BY STATES
POPULATION
MILLIONS
40 35 30 25 20 15 10 5 0
DENSITY PERSONS PER SQUARE MILE
0 100 200 300 400 500 600 700 800 900
ANDHRA PRADESH
ASSAM
ASSAM (EXCLUDING NEFA)
NEFA
BIHAR
48·3
BOMBAY (BILINGUAL)
GUJARAT
MAHARASHTRA
J & K
KERALA
M P
MADRAS
MYSORE
ORISSA
PUNJAB
RAJASTHAN
63·2
U P
WEST BENGAL
ANDAMANS & NICOBAR
DELHI
3044
11,753
H P
MANIPUR
TRIPURA
0 500 1000 1500 2000 2500 3000 3500
DENSITY PERSONS PER 1000 HECTARES

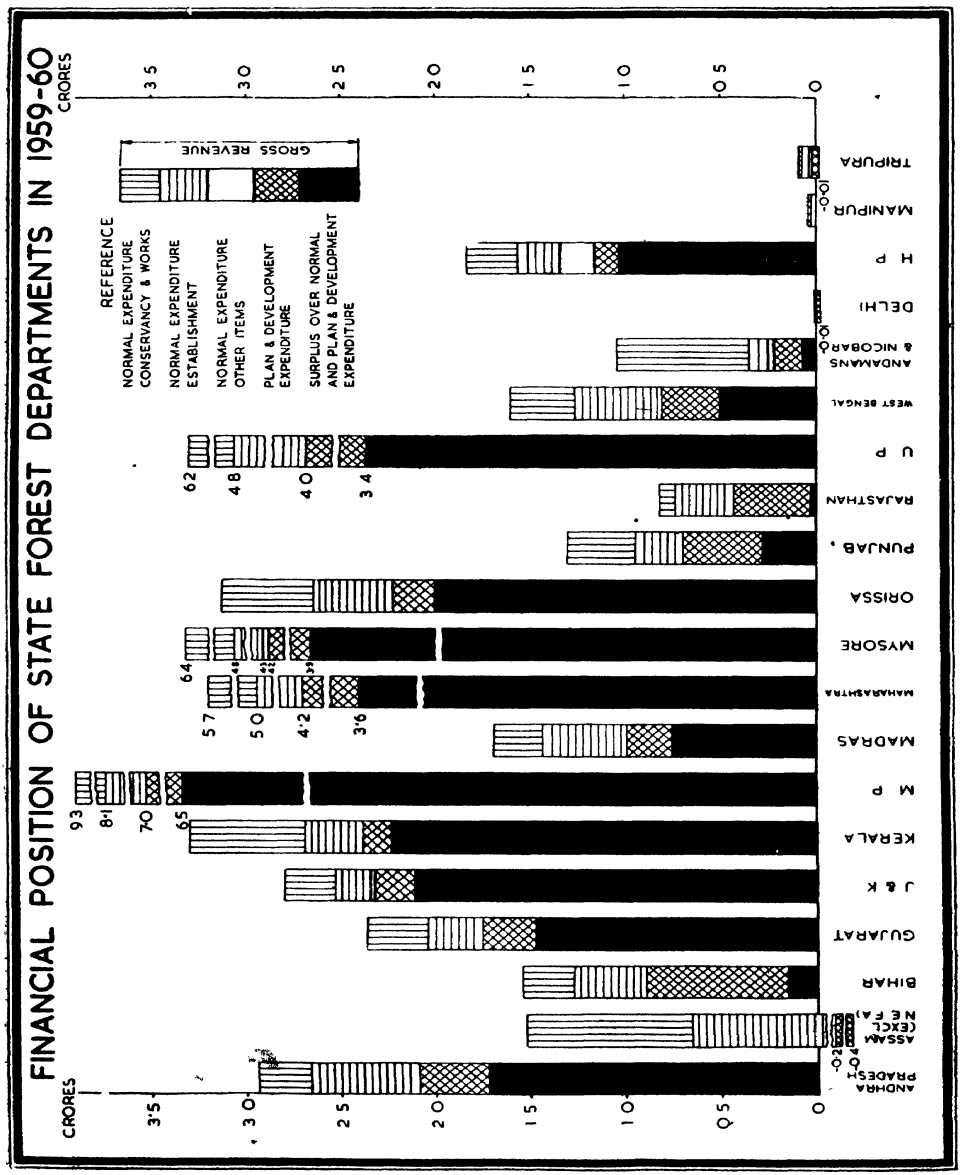

TOTAL FOREST AREA PER INHABITANT
ACRES.
HECTARES
INDIA
ANDHRA PRADESH
ASSAM
ASSAM (EXCLUDING NEFA)
N E F A
BIHAR
BOMBAY (BILINGUAL)
GUJARAT
MAHARASHTRA
J & K
KERALA
M P
MADRAS
MYSORE
ORISSA
PUNJAB
RAJASTHAN
U P
WEST BENGAL
ANDAMANS & NICOBAR
DELHI
H P
MANIPUR
TRIPURA
0
05
10
15
19
0
01
02
03
04
05
06
07
0764
240
9·7125
26
10522
5·33
2·57
2·36
2·48
0·96
2·42
0

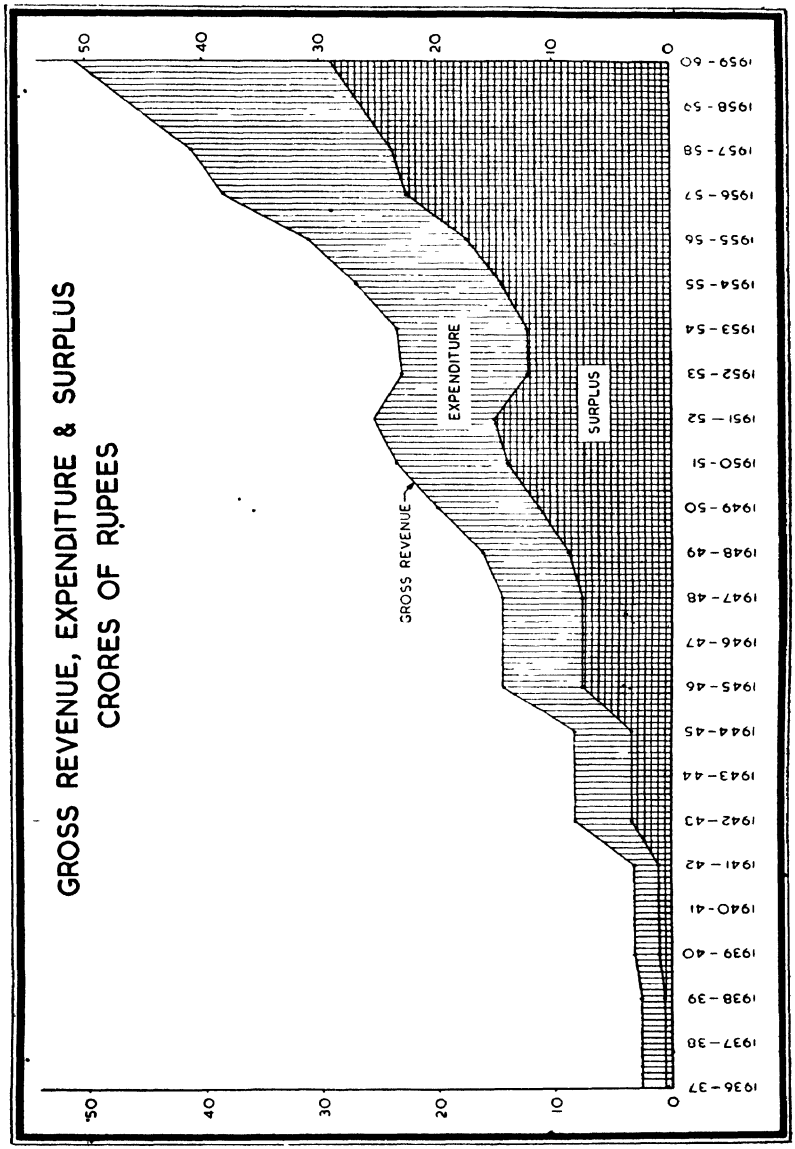

CLASSIFICATION OF FORESTS BY OWNERSHIP
REFERENCE
PRIVATE FOREST
COMMUNAL FOREST
STATE FOREST
TOTAL FOREST
PERCENT ALL INDIA
23%
SQ MILES
SQ KILOMETRES
70,451
182468
ANDHRA PRADESH
ASSAM
ASSAM (EXCLUDING N.F.A.)
N E F A
BIHAR
BOMBAY (BILINGUAL)
GUJARAT
J & K
KERALA
M P
MADRAS
MYSORE
ORISSA
PUNJAB
RAJASTHAN
U P
WEST BENGAL
ANDAMANS & NICOBAR
DELHI
H P
MANIPUR
TRIPURA


CLASSIFICATION OF FORESTS
BY LEGAL STATUS
REFERENCE
UNCLASSED FOREST
PROTECTED FOREST
RESERVED FOREST
TOTAL FOREST AREA
INDIA
47.1%
30.3%
22.6%
SQ MILES
SQ KILOMETRES
82468
70451
137156
52,956
ANDHRA PRADESH
ASSAM
ASSAM (EXCLUDING N.E.F.A.)
N.E.F.A.
BIHAR
BOMBAY (BILINGUAL)
GUJRAT
MAHARASHTRA
J & K
KERALA
M.P.
MADRAS
MYSORE
ORISSA
PUNJAB
RAJASTHAN
U.P.
WEST BENGAL
ANDAMANS & NICOBAR
DELHI
H.P.
MANIPUR
TRIPURA


CLASSIFICATION OF FORESTS BY COMPOSITION
REFERENCE
CONIFEROUS FOREST
BROAD LEAVED FOREST
TOTAL FOREST AREA
COMPOSITION IN INDIA AS A WHOLE
96.7%
3.3%
SQ KILOMETRES
SQ MILES
ANDHRA PRADESH
ASSAM
ASSAM (EXCLUDING NEFA)
NEFA
BIHAR
BOMBAY (INCLUDING GUJARAT)
GUJARAT
MAHARASHTRA
J & K
KERALA
M P
MADRAS
MYSORE
ORISSA
PUNJAB
RAJASTHAN
U P
WEST BENGAL
ANDAMANS & NICOBAR
DELHI
H P
MANIPUR
TRIPURA


FOREST AREA UNDER WORKING PLANS (BY STATES)
SQ KILOMETRES
SQ MILES
REFERENCE
AREA OF OTHER FORESTS NOT UNDER WORKING PLANS
AREA OF DEPARTMENTAL FOREST NOT COVERED BY WORKING PLANS
AREA COVERED BY WORKING PLANS
TOTAL FOREST AREA
PERCENT ALL INDIA
15.1%
37.2%
47.7%
70,451
182468
ANDHRA PRADESH
ASSAM
ASSAM (EXCLUDING NEFA)
NEFA
BIHAR
BOMBAY (BILINGUAL)
GUJARAT
MAHARASHTRA
J & K
KERALA
M P
MADRAS
MYSORE
ORISSA
PUNJAB
RAJASTHAN
U P
WEST BENGAL
ANDAMANS NICOBAR
DELHI
H. P
MANIPUR
TRIPURA


FINANCIAL POSITION OF STATE FOREST DEPARTMENTS IN 1959-60
CRORES
REFERENCE
NORMAL EXPENDITURE CONSERVANCY & WORKS
NORMAL EXPENDITURE ESTABLISHMENT
NORMAL EXPENDITURE OTHER ITEMS
PLAN & DEVELOPMENT EXPENDITURE
SURPLUS OVER NORMAL AND PLAN & DEVELOPMENT EXPENDITURE
GROSS REVENUE
ANDHRA PRADESH
ASSAM (EXCL. N E FA)
BIHAR
GUJARAT
J & K
KERALA
M P
MADRAS
MAHARASHTRA
MYSORE
ORISSA
PUNJAB
RAJASTHAN
U P
WEST BENGAL
ANDAMANS & NICOBAR
DELHI
H P
MANIPUR
TRIPURA



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