

PROGRESS

OF

FOREST ADMINISTRATION

IN

INDIA,

1880 to 1884.

CALCUTTA:

PRINTED AT THE HOME DEPARTMENT PRESS.

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FORESTS.

The Forest Department is one of the Branches of business made over to the Home Secretary, but is in charge of the Member of Council who holds the portfolio of the Revenue and Agricultural Department. The Inspector General of Forests, besides acting as professional adviser of the Government in all Forest matters, fulfils the functions of Under Secretary in the Department, submitting cases direct to the Secretary. The Members in charge since 1880 have been the Honourable Mr. Rivers Thompson up to the 9th May 1882, and the Honourable Sir S. C. Bayley from that date to the present time. For the past three years the Inspector General has been Dr. W. Schlich. His predecessor was Dr. D. Brandis, C.I.E., whose labours in the cause of Forestry in India must always command the grateful remembrance of Government.

1. The most remarkable feature in Indian Forest Administration during the last five years has been the rapid increase of the Revenue. Introductory. Five years ago it amounted to 68 lakhs of rupees, and now it has risen to 104 lakhs. This is some measure of the increasing demand on the Government forests, which is chiefly due to the destruction of private forests, brought about by the extension of railway communication; and the increasing prosperity of the country.

2. The private forests have for a number of years past, and it may be said since the occupation of India by the British, which event was contemporaneous with the springing up of an increased demand, been steadily reduced by indiscriminate fellings without regard to reproduction. In some cases the object was to clear the ground for cultivation, and in others to satisfy an ever-increasing demand for forest produce. Where railways have been constructed, the forests have rapidly disappeared, not only to make room for the march of civilisation, but also to supply the large requirements of the lines. Taking into consideration the special impetus which has lately been given to the construction of additional railways, the final destruction of most private forests within a reasonable distance from them may safely be predicted. The result of this change is that the requirements for forest produce, which were formerly chiefly satisfied from private domains, must, in an ever increasing proportion, be obtained from the Government lands.

3. These circumstances naturally demand special attention, and steps have had to be taken to counteract, as far as lies in the power of Government, the effects of this indiscriminate destruction of forests in all the more advanced districts.

In a country like India it is absolutely necessary that a certain portion of the land shall always remain under forest. It is not possible to ascertain the actual proportion so covered at present, but it may be put down as not less than one-fourth of the total area. It is also necessary that the forest area should be distributed over the country in a suitable manner.

Forest Department.

4 The total area of British India may be taken as about 880,000 square miles. The area over which the Indian Forest Department exercises control is as follows:—

			AREA.
			Square miles.
Reserved forests	...	...	49,188
Protected „	...	...	8,584
District „	...	...	16,862
Total			74,634

The area of district forests in Madras, Bombay, Burma, Coorg, and Ajmere is not known at present, but it is presumed that, by adding this to the above, the total area over which the authority of the Department now extends may be put down at 100,000 square miles. This represents less than one-half of the minimum forest area which may be said to be necessary for the well-being of the country. Moreover, the control over about one-half of the above-mentioned area is, for various reasons, of a very limited nature, so that barely 50,000 square miles, or about one-fourth of the required area, can be considered as under real forest conservancy. It follows that, if complete protection is to be given to the country against future dearth of forest produce, either the area of Government lands under actual forest management must be very considerably increased; or laws must be passed which permit a certain interference with private forests; or recourse must eventually be had to both of these measures.

5 Every effort has been made during the last five years to increase the areas under conservancy, and to provide for their better and closer management. Forest laws have been passed, the organization improved, the staff re-organized, the training of superior and subordinate establishments considerably advanced, and steps have been taken towards the systematic preparation of Forest Working-Plans, which will ensure not only the most advantageous method of working the forests with due consideration of the requirements of the people, but also enable Government to follow the working at every step, so as to render the estates an everlasting and increasing benefit to the general community.

The following paragraphs notice, in a concise manner, the principal measures which have occupied the attention of the Government of India during the last five years.

6 A general Indian Forest Act was passed in 1878, which provides for the preservation and management of the forests, the control of forest produce in transit, and the duty leviable on timber. It has been extended to all British Indian provinces, except Madras, Burma, the Hazara District in the Punjab, Ajmere, Coorg, and Berar. For Ajmere and the Hazara District special regulations are in existence. Forest legislation for Burma, Madras, Coorg, and Berar has occupied the attention of the Government of India during the last five years. An Act for Burma was passed in 1881, and one for Madras in 1882, while a Forest Regulation for Berar is before the Legislative Department of the Government of India, and may be expected to become law before the close of 1884. The authorities in Coorg are now considering whether to introduce into that province the Indian Act or the Madras Act.

Forest Legislation.

7. It may be asked why special legislation was necessary for a few provinces, when the general Indian Forest Act sufficed for all the others. As a matter of fact these separate enactments are more the result of circumstances than of necessity. There is no reason whatever why one general Act should not do for all provinces, but, owing to certain defects in the Act of 1878, the Chief Commissioner of British Burma declined to extend it to that province, and the Government of Madras held that its provisions could not be applied to the Southern Presidency for reasons which will be explained further on; while in Berar certain forest rules existed, which obviated the necessity of immediate legislation for that province.

8. The Burma and Madras Acts proceed on the same general lines as the Indian Act, but, besides certain minor improvements, they differ on an important point, which is this, that the general Indian Act recognises two different classes of demarcated State Forests,—Reserved and Protected Forests,—while the later enactments recognise only one class.

9. When the Indian Forest Act of 1878 was first drafted, it was intended to create only one class of demarcated State Forests, viz., Reserved Forests, originally so called because the areas were reserved from cultivation; but as their formation would take time, provision was also made for the protection of the Government forest areas generally, until it could be decided what areas should be maintained permanently as forests by constituting them demarcated or reserved forest. In passing the Bill through Committee in the Legislative Department considerable changes were introduced, which ended in providing for the constitution of—

- (a) Reserved Forests (Chapter II. of the Act); and
- (b) Protected Forests (Chapter IV. of the Act).

Chapter II. provides for the demarcation of reserves; and for enquiry into, and the record and regulation of rights; prevents the springing up of new rights except under the orders of Government; and arranges for the protection of the areas. In a word, Chapter II. provides the proper means for the constitution and maintenance of permanent forest estates, in an efficient and business-like manner.

10. Chapter IV., in constituting Protected Forests, attempts something of the same kind, but in a less complete manner; it demands an enquiry into rights and their record, but the statements in this record are only considered correct until the contrary is proved, and it does not provide for the proper regulation of the rights, whenever this should appear necessary for the purpose of maintaining the forest as such. Nor does it provide sufficient means for the protection of the area and of the forest growth on it. It follows that Chapter IV. attempts too much on the one hand and too little on the other, and consequently it is, in its present shape, an anomaly. Unfortunately it has occasionally been made use of in order to avoid the more minute procedure prescribed in Chapter II., and thus attempts have been made to create permanent forest estates under it without securing the necessary guarantees of lasting success.

11. When the time has come for a general revision of the Act, these shortcomings must be removed. In the meantime, Burma and Madras have taken advantage of the experience gained since 1878, and have substituted for Chapter IV. a set of simple provisions which do not attempt a half-hearted record of rights, but merely provide in a general way for the protection of the forest produce on all Government lands, until the demarcation and settlement of the permanent State forests have been completed.

12 Another point on which the Burma and Madras Acts differ from the Indian Act is in the matter of "private forests." The latter Act provides that the Government may assign to any village community land which has been constituted a reserved forest; hence, in order to constitute a "village or communal forest," it is necessary to go first through the procedure of making it a reserved forest. The Burma Act, on the other hand, provides that any land at the disposal of Government may be constituted a village forest for the benefit of any village community or group of such communities. This is a much more expeditious method of procedure, and in this respect also the Burma Act is superior to the Indian Act. The Madras Act contains no provision for the constitution of village forests in the above sense.

13 The Berar Forest Regulation, which is about to become law, is in many respects of a more simple description than either of the previous Acts, because in that province all Government lands were at settlement declared free of rights, and, in order to constitute a State forest, only a notification to that effect in the Local Government Gazette is required. The Regulation recognises only one class of demarcated State forests, for which it provides the proper means of protection, as well as for making the several areas as generally useful as is compatible with due regard to their maintenance as forests.

14 On the whole, it may be safely maintained that, although the Indian Forest Laws are not perfect, very considerable progress has of late years been made in improving them. Whether ultimately each province will have its separate Act, or whether the several Acts now existing will be summed up in one, it is at present difficult to foresee; it would, however, appear to be the most natural and suitable arrangement that the efforts of the administration should be directed towards the passing of one Act embodying the leading general principles of forest legislation, which must be the same in all countries, and giving powers to the several Local Governments to draw up, under the authority of the central law, regulations to suit the peculiarities of each province.

15 The present enactments provide for the promulgation of *local rules* under various sections of the Acts. In accordance with these provisions numerous sets of rules have been drawn up and passed, during the last five years, in Madras, Bombay, Bengal, North-Western Provinces and Oudh, Punjab, Burma, Assam, and Coorg.

16 *Departmental Organization.* The Forest Staff is divided into—

- (a) Controlling Staff,
- (b) Executive Staff, and
- (c) Protective Staff.

The Controlling Staff will henceforth consist of all officers holding the rank of Assistant Conservator and upwards; it has been re-organized in all three presidencies during the last three years.

17 The creation of the Forest Department is of comparatively recent date, its first organization in the *Bengal* Presidency having been attempted as late as 1862. Since then the work has increased rapidly, and frequent changes have been necessary in the number and the grading of the staff to meet the growing requirements of the administration. The first graded list of Conservators, Deputy, and Assistant Conservators was constructed in 1869, when the staff consisted of 57 officers, costing on the average Rs. 577 each a month. Subsequently frequent additions were made, until in 1882 the staff consisted of 94 officers, costing on the average Rs. 558 each a month. More from necessity than design the rate of pay had thus been reduced, while the number of officers was increased, so that the prospects

Departmental Organization.

of promotion for the junior officers were less favourable in 1882 than they were in 1869. In particular the proportion of higher appointments was very small, the number of Conservators and Deputy Conservators being to Assistant Conservators in the proportion of 1 to 1. The result was that a junior Assistant Conservator had to serve from 12 to 15 years before he could hope to be promoted to the grade of Deputy Conservator on Rs. 500 per mensem; and from 18 to 20 years before he could reach the rank of Deputy Conservator on Rs. 700 a month. This was not so much felt while the Department was of recent creation and the majority of the officers were young, but for some time past a strong feeling of dissatisfaction and disappointment with their position and prospects had sprung up amongst the staff, and in order to meet the just claims of a deserving body of servants of the State, a re-organization was decided on, which, having received the sanction of Her Majesty's Secretary of State, came into operation on the 3rd September 1882.

18. Under this re-organization the number of officers was raised to 100, while the average rate of pay was fixed at Rs. 642 a month per officer. In 1884 three officers were added to meet the increased requirements of Burma, and recently an officer has been sanctioned for Biluchistan, so that at the present moment the staff in the Bengal Presidency stands as follows:—

	Rates of pay.	No.
Conservators of Forests (Rs. 1,000, 1,250, and 1,500)	...	10
Deputy ditto („ 550, 650, 800, and 900)	...	54
Assistant ditto („ 250, 350, and 450)	...	35
Special appointments in connection with the Forest School, Survey and Working-Plans (Rs. 600 to 900)	...	5
	Total	... 104 officers.

19. Before this re-organization came into force the Forest staff had by a series of measures been localised. Accordingly, the new staff (with the exception of the five special appointments) was arranged in five lists as follows:—

Provincial list.	Conservators.	Deputy Conservators.	Assistant Conservators.	Total.
1. Bengal-Assam ...	2	10	7	19
2. North-Western Provinces and Oudh ...	3	10	7	20
3. Punjab (including Biluchistan) ...	1	11	7	19
4. Central Provinces—Berar (including Coorg).	2	11	7	20
5. British Burma (including the Andamans)	2	12	7	21
Total ...	10	54	35	99

At the present moment a proposal to appoint three additional officers for Assam is under submission to Her Majesty's Secretary of State.

20. In *Madras* the Controlling Staff had gradually grown, until it consisted, in December 1882, of 16 officers, with an average rate of pay of Rs. 455 each officer a month. Very considerable changes, which will be explained further on, were introduced in 1882, which rendered a re-organization absolutely necessary, and accordingly in February 1883 Her Majesty's Secretary of State sanctioned the following staff:—

Conservators of Forests	...	2
Deputy Conservators of Forests	...	14
Assistant „ „	...	8
	Total	... 24 officers,

with an average pay of Rs. 648 a month per officer, the grading being the same as that on the list of the Bengal Presidency. This staff

has already proved insufficient for the requirements of the province, and a proposal to add four officers to it is now before Her Majesty's Secretary of State.

21. Similarly, the staff in *Bombay* consisted in 1883 of 23 officers drawing pay at the rate of Rs. 551 each officer. A re-organization was sanctioned in November 1883, which provides the following staff :—

Conservators of Forests	...	...	3
Deputy Conservators of Forests	...	...	14
Assistant do. do.	...	...	10
Total			27 officers,

with an average rate of pay of Rs. 635 each a month. The Government of *Bombay* does not consider this staff sufficient, and it has pointed out that the number of officers must shortly be further increased, if the Department is to do justice to the work devolving upon it.

22. To sum up, the Controlling Staff in the three presidencies stands as follows :—

	Rates of pay.	No.
Inspector General of Forests to the Government of India	... Rs. 1,700 to 2,000	... 1
Conservators of Forests	... „ 1,000 to 1,500	... 15
Deputy Conservators of Forests	... „ 550 to 900	... 82
Assistant do. do.	... „ 250 to 450	... 53
Special appointments	... „ 600 to 900	... 5
Total		... 156 officers.

Proposals for seven additional officers are under consideration, irrespective of the *Bombay* claims. Hence it may be assumed that the total staff will, during the next few years, rise to about 170 officers in all. Efforts should be made to prevent any further growth for a series of years to come by developing the executive staff, and thus creating a cheaper agency for the subordinate duties.

23. While the duties of the Controlling Staff consist chiefly in exercising a proper supervision over the operations of the Department, those of the rest of the Staff comprise the executive and protective work. The creation of an efficient and trustworthy Local Staff is specially difficult in a country like India, for reasons which need not be detailed here. Suffice it to say that special efforts have been made during the last five years to attain the desired end, by a more careful selection of the men to be employed, by educating them for their profession, and by holding out reasonable prospects of advancement. It would lead too far to detail all the various steps taken in this respect; the final result as now arrived at is as follows :—

The Executive Forest Staff comprises—

	Monthly pay.
(a).—Sub-Assistant Conservators	... Rs. 150 and upwards.
(b).—Forest Rangers	... „ 50 to 120.

The Protective Forest Staff comprises all members of the forest establishment below the rank of Forest Ranger, such as Foresters, Forest Guards, &c.

24. The Conservator of Forests has the general control of forest matters in a province or in part of a province. His charge is generally called a circle, and it is sub-divided into the following charges :—

I.—Divisions, or controlling charges, held by Deputy Conservators, Assistant Conservators, 1st grade, and officers of a lower grade who have qualified for the charge of a Division.

II.—*Ranges, or executive charges*, held by Assistant Conservators of the 2nd and 3rd grades, Sub-Assistant Conservators, and Forest Rangers.

III.—*Beats, or protective charges*, held by Foresters and Forest Guards.

25 When the Forest Department was first started, the officers were generally placed under the direct orders of the Conservator of Forests, who in his turn was responsible to the Local Government. Soon, however, it was felt that the officers were in a somewhat isolated position, and that often friction took place between them and the ordinary Civil and Revenue Administration of the country. Hence the desire sprung up to connect the two services more closely, and systematic proposals for giving effect to this were put forward by Mr. Brandis, late Inspector General of Forests to the Government of India, when submitting a scheme for a re-organization of the Bombay Forest Staff in 1870. The plan then adopted consists of the appointment of a "District Forest Officer" to each district or collectorate, who is in charge of all forest matters in the district, and entirely subordinate to the Collector, through whom he corresponds with the Conservator.

The next step in this direction was taken by the Chief Commissioner of the Central Provinces, who introduced in 1877 a modified system, according to which the Conservator and his Assistants remain in independent charge of all Reserved Forests, while the District Forest Officers are subordinate to the Deputy Commissioners regarding all Unreserved Forests.

A further modification was introduced by the Government of the North-Western Provinces and Oudh in 1880, by which the District Forest Officer is made subordinate to the Collector, his correspondence being arranged in two classes; that referring to accounts, establishments, and a few other subjects is sent direct to the Conservator of Forests, while that on all other subjects is submitted by the District Forest Officer to the Collector, who forwards it to the Conservator.

The same system was introduced into Assam on the 1st January 1882.

In Bengal the subject has been under consideration for a number of years, and arrangements have now been made to establish the connection between the Civil and Forest administration in most districts. The system has, however, been modified in some parts of the country by placing a senior Deputy Conservator of Forests under the orders of the Commissioner of the Division instead of under those of the District Officer.

In the Hazara and Rawal Pindi Districts of the Punjab the Forest Officers have for many years past been nominally subordinate to the Deputy Commissioners. In 1881 proposals were submitted to make the system general in the province, and this is now being done.

In Madras a system similar to that adopted in Bombay has been in force for some time, but the arrangements were improved in 1882.

At the suggestion of the present Inspector General of Forests the system has just been introduced into Berar.

26 Generally speaking, it may be said that during the last five years the principle has been accepted and carried into effect in all provinces where this had not been done previously. These measures are calculated to be of considerable importance for the purposes of forest conservancy in India. The Forest Department having thus become an integral part of the general administration, all jealousy and friction

about lands and revenue disappears; and the Collector or Deputy Commissioner being directly interested in the administration of the forest lands, a thorough safeguard has been established that the forest law is applied in a judicious manner, and that the requirements of the people of the district are duly considered. On the other hand, the just demands and requirements of forest conservancy will be attended to under the full authority of the head of the district, while full control over the departmental finance, the organization, and the technical part of the work has been reserved to the Conservator of Forests—an arrangement which will ensure a proper continuity of the work of the Department.

27. As far back as 1867 arrangements were made, partly in France and partly in Germany, for the Training of Forest Officers in Europe. professional education of the members of the Controlling Staff. Under these arrangements 79 trained officers have up to date joined the Department in India. Of late years, however, a desire has made itself felt of providing the means of education in England, so as to make the Department independent of foreign countries. The subject has been discussed in detail for several years past, and it has now been decided to start a Forest class at Cooper's Hill. During the discussion of this subject the Government of India, while admitting the desirability of having a National Forest School in England, has repeatedly expressed doubts whether the time for the contemplated change had come, and it has more particularly been pointed out that England does not at the present moment possess any forests fit for training grounds in all the branches of Forest science and practice required by an Indian Forest Officer; and it was suggested that the arrangements hitherto obtaining might remain in force until such training grounds had been established in England. However, it has now been decided to start operations at Cooper's Hill in September 1885, and if the various authorities work harmoniously together, there is perhaps no reason why the new institution should not, in course of time, become a success. The most essential point is that the management of some of the English Crown forests should be so altered as to afford the necessary means for the practical instruction of the students.

28. The most important educational measure has been the establishment of the Dehra Dún Forest School. As early as 1869 special attention was drawn to the necessity of training Natives of India for forest work. Various experiments were made, until the Dehra Dún Forest School was established in 1878. As a matter of fact, however, little training, and that only practical, was done until 1881. In that year, for the first time, the work was started in a systematic manner, and the first course of theoretical instruction commenced on the 1st July 1881. Since then the arrangements have been considerably improved, until, by a Resolution dated the 3rd June 1884, the School was placed on a new basis. Until then it had been a provincial institution, though students from all provinces were admitted. By the above-mentioned Resolution the School was converted into an Imperial establishment and placed under the orders of the Inspector General of Forests, who arranges for the instruction and management in consultation with the Government of the North-Western Provinces and Oudh. The Director of the Forest School will, as hitherto, be also Conservator of the School Forests, and thus maintain a direct connection with forests suitable for teaching. The Director will be assisted, in the first place, by two officers, the Deputy Director and the Instructor, who are both officers holding the rank of Deputy Conservator. One of these two officers devotes the whole of his time to instruction in Forestry, while the other holds charge of the

The Forest School at Dehra Dun.

Dehra Dún Forest Division, in the middle of which the School is situated, and also assists in the instruction in auxiliary sciences. The remaining branches are taught by several other Forest and Survey Officers, who have their head quarters at Dehra Dún during summer.

29. The School was originally established for the training of Foresters and Forest Rangers, and this principle has been maintained; but arrangements have also been made for the occasional instruction of members of the Controlling Staff who were appointed to the Department in India. Apart from the last mentioned branch, there are two classes, one in English and one in Hindustani, the former being called the *Rangers'* class and the latter the *Foresters'* class. The students of the English class are required to produce the certificate of having passed the Entrance Examination of an Indian University on the English side, and they are, if successful, granted, on leaving the School, certificates of qualification as Rangers. The students of the Vernacular class are required to prove that they have passed the Middle Class Examination in the North-Western Provinces and Oudh, or some corresponding standard in another province, and that they possess a competent knowledge of Urdu or Hindi. The course of instruction followed in this class is, for the present, of a much more elementary nature than in the case of the *Rangers'* class, and the students receive, if successful, on leaving the School, certificates as Foresters, which may also be given to students of the English class who have failed to qualify as Rangers.

30. The men who leave the School with the *Rangers'* certificate will ordinarily be appointed as Rangers on return to their province, and they become eligible for promotion to the rank of Sub-Assistant Conservator of Forests, after five years' satisfactory service as Rangers. The men who only obtain the *Foresters'* certificate will be employed as Foresters, but they can qualify for promotion to the class of Rangers by rendering satisfactory service as Foresters for not less than two years after their return from the School; they are ordinarily not eligible for promotion to the class of Sub-Assistant Conservator of Forests. Thus men of superior education will enjoy considerable advantages, while at the same time an opening is left for the advancement of Natives who do not know English.

31. The instruction comprises at present the following branches:—

- (1). Mathematics.
- (2). Elements of Physics and Chemistry.
- (3). Elements of Mineralogy and Geology.
- (4). Surveying, theoretical and practical.
- (5). Vegetable Physiology, and Systematic Forest Botany.
- (6). Forestry, especially Sylviculture, Working-Plans, Forest Utilisation and Forest Protection, both theoretical and practical.
- (7). Forest Law.
- (8). Road-making and Building.

The importance of a proper development of the Dehra Dún Forest School cannot be over-rated, and it is hoped that nothing will occur to prevent its further improvement. It has lately been suggested to add to it a class for the education of Subordinate Revenue Officers, and if this is done, the importance of the School will be further enhanced and its usefulness extended.

§2 The principal works on Forestry and cognate subjects brought out under Government patronage during the last five years are :—

Indian Forest Literature.

- (1).—Gamble's "Manual of Indian Timbers," 1881.
- (2).—Baden-Powell's "Manual of the Land Revenue Systems and Land Tenures of British India," 1882.
- (3).—Baden-Powell's "Manual of Jurisprudence for Forest Officers," 1882.
- (4).—The Indian Forest Code, 2nd Edition, published in 1881 : a 3rd edition is now in the Press.

In addition to the above a Manual of Indian Sylviculture is under preparation.

§3 Gamble's "Manual of Indian Timbers" contains descriptions of the wood of 906 species, belonging to 432 genera, the information for each species being arranged under the following heads :—

- (1).—Scientific name.
- (2).—Vernacular names.
- (3).—Descriptions of the wood.
- (4).—Geographical distribution of the tree.
- (5).—Rate of growth.
- (6).—Weight and strength.
- (7).—Uses.
- (8).—List of specimens used in identification and description.

The book is a very store-house of information regarding all the more important timbers growing in India.

§4. Baden-Powell's two excellent Manuals are of the very greatest use to the Department as well as to Revenue Officers, and they have been made the prescribed text books for the examination of Forest Officers in Revenue and Forest Law. The Revenue Manual opens with an attempt, of a somewhat novel character, to give a comparative account of the Land Tenures of India generally, followed by a similar comparative account of the different Land Revenue Systems, viz., the permanent settlement, the malguzari settlement of the Central Provinces, the village or mouzawar settlement of Northern India, and the ryotwari settlement of Madras and Bombay. The remaining or special portions of the book are devoted to a more detailed description of the system of each province, concluding with a chapter comprising the systems of the outlying provinces, such as Burma and Assam, in which none of the well known great revenue systems prevail, but in which special revenue arrangements, probably of a tentative character, have been adopted.

§5. The Manual of Jurisprudence for Forest Officers is the first of its kind which has been published in English, and is the outcome of extended study on the part of the author. The subject of Forest Law in India is of too recent growth to make the Indian Forest Acts a complete representation of Forest Law. The author has therefore given a more complete view of the general principles underlying Forest Jurisprudence, and, for the purpose of comparison, the principles of forest law derived from the leading text books of English, French, German, and Italian Law. His remarks are followed by practical illustrations drawn from the Indian and Burma Forest Acts. Then follow chapters on Criminal Law dealing with the protection of the forests and the punishment of offences both against the forests and their produce in transit, together with the principles of Criminal Procedure. The next chapter deals with the legal organization of the Forest Service, and the duties and liabilities of Forest

Officers. The last chapter deals briefly with portions of the Law of Contract, the outlines of Civil Procedure, and with the Stamp and Registration Laws, as far as Forest Officers need be acquainted with them.

36. The necessity of procuring suitable maps of the forests and the surrounding country, and of managing the forest estates according to well considered plans, was recognised at an early stage of Indian Forest management. Accordingly, in 1872, a scheme was started of providing a special Survey and Working-Plans Branch of the Department. Only the Survey, however, was actually started, while the Working-Plans Branch remained a dead letter for many years afterwards.

The Forest Survey, which is suitably connected with the Imperial Survey of India, has done good work ever since 1872. During the last five years it has chiefly surveyed and mapped forests in the North-Western Provinces and in Berar. Apart from the special Survey, a considerable area of forests has, during the last few years, been surveyed by the regular Survey Department in Burma and in Bombay.

The Working-Plans Branch has actually been brought into existence only during the last five years, first by starting the preparation of working-plans in a more regular manner in the North-Western Provinces, Burma, the Punjab, and other provinces, and quite lately by introducing a regular system of preparation and a control by a central office under the authority of the Inspector General of Forests. This last measure must be considered as of the first importance, and it may therefore be useful to indicate here its leading principles and motives.

37. A working-plan will henceforth be prepared for every reserved forest or a collection of reserved forests, as well as for all important protected or other forests under the management of the Forest Department. It will be based upon the present condition of the forests, and it will deal with all points connected with their management and improvement, amongst which the following are the most prominent:—

- (i). Calculation of the growing stock :
- (ii). Calculation of the annual increase :
- (iii). Calculation of the quantity of material to be removed, annually or periodically, with due consideration of the production of the forest and of the demand ;
- (iv). Arrangements for the re-stocking of all cleared areas (natural reproduction, sowing and planting, protection against fire, grazing, &c.)

The accuracy or minuteness of each working-plan will depend on the demands which are made on the forests, the nature and value of the produce removed from them, and the other purposes which they are to fulfil. The preparation of the working-plans is carried out by selected members of the staff allotted to the several provinces, who work under the orders of the Conservators of Forests. The general supervision of the Branch has been entrusted to the Inspector General of Forests, who is assisted by the Assistant Inspector General of Forests and Superintendent of Working-Plans. The Inspector General or his Assistant visits, whenever necessary, the provinces where working-plans are under preparation or revision, and advises the local officers regarding the general lines on which the work shall be carried on. The working-plan, when drawn up, is sent, by the local Conservator, to the Inspector General of Forests for

opinion and remarks, after which the Local Government passes orders on it. In due course the working-plan is, in the same way as land revenue settlements or similar works, submitted to the Government of India, either for record or for orders. No deviation from an approved working-plan is permitted without the previous orders of the Local Government.

38. A record of all working-plans and their provisions is kept in the Inspector General's Office, where the execution of the sanctioned plans is watched. If any deviation is noticed, the Inspector General of Forests either draws the attention of the Local Government to it, or he submits the case to the Government of India for the necessary orders.

The localisation of the forest business, which has been effected of late years, left the Government of India without any real safeguard that the valuable Government forests are managed in the right way. The systematic preparation of working-plans and their control gives to the Government of India the means of following the working of the forests, without unduly interfering with the necessary freedom of action of the Local Governments.

39. The Government of India has of late years taken an exceptionally large share in pushing on
Forestry in Madras. forest conservancy in Madras. Madras was among the first of the Indian provinces in which forest conservancy received attention; indeed, the well-known Nilambûr Teak plantations were commenced as early as 1844, though a regularly constituted Forest Department was apparently not started until 1856. The development of the Department was peculiar, and towards the year 1875 it had become apparent that its principal efforts were directed towards the establishment of plantations and groves scattered over the country, while the natural forests of the presidency were under a mere nominal control. Then came the Famine Commission in 1877, and pointed out the necessity of more vigorous action in the protection and re-stocking of the natural forests, more especially those situated in the catchment areas of the principal irrigation rivers. Action was repeatedly urged upon the Government of Madras, not only by the Government of India, but also by Her Majesty's Secretary of State.

40. The more immediate cause for direct interference arose out of the introduction of the Indian Forest Act of 1878. When that Act was under consideration, the Madras Government declared it unsuitable for extension to Madras, because it was held by that Government that the rights of villages over the waste lands and jungles were of such a nature as to make it impossible to constitute forest estates under the provisions of the Indian Forest Act. Subsequently, however, these views were renounced by the Government of Madras as erroneous, and it was decided to pass a special Act for the Southern Presidency. The first draft of a Madras Forest Bill, which was submitted to the Government of India, was found to be full of defects as regards both substance and form, and was therefore not approved. After further correspondence a new Act was submitted for the assent of His Excellency the Governor General in Council, but it was found that both from a forest and a legal point of view the Act was unsuitable. Accordingly His Excellency the Governor General in Council vetoed the Act in September 1881, and deputed Mr. Brandis, late Inspector General of Forests to the Government of India, to Madras, with the view of his conferring with the Madras Government on the whole subject of forest conservancy in that presidency. Mr. Brandis left for Madras in October 1881, and remained there until January 1883. During that time he visited nearly all the important forest Districts,

Forestry in Madras.

and submitted proposals to the Government of Madras, which now form the basis of active forest conservancy in the presidency.

41 The first step of importance was the amalgamation of the Jungle Conservancy Fund with the Provincial Forest Department, and, in connection therewith, the localisation of the receipts and charges of the Department. Next, the Collector was appointed chief of the Forest Department in each district, with a District Forest Officer as Assistant; while the districts were arranged in two Circles, the Northern and Southern, each presided over by a Conservator of Forests, who is the Consulting and Inspecting Officer, with authority in matters of finance and establishments.

In order to provide the necessary staff, a comprehensive re-organization of the superior and subordinate establishments was worked out, and received the sanction of the Government of India and of Her Majesty's Secretary of State for India. Three of the best officers belonging to the staff under the Government of India were, at the request of the Madras Government, transferred to the Southern Presidency, in order to obtain the benefit of the experience gained in the more Northern Provinces.

The long pending question of a Forest Law for the Madras Presidency was brought to a satisfactory conclusion by the passing, with effect from the 1st January 1883, of the Madras Forest Act, No. V. of 1882.

42 Having thus been provided with the necessary and appropriate means of action, the Department may be said to have started forest work on new lines towards the close of the year 1882. The subject which claims foremost attention is the demarcation and settlement of permanent forest estates, constituted under Chapter II. of the Act. The areas which have hitherto been considered as under the more special management of the Department amount to 824 square miles in the Northern Circle and to 2,045 square miles in the Southern Circle, or a total of 2,869 square miles. These areas have been, or will be, declared reserves under the Forest Act, together with other forest lands of considerable extent, and in the meantime they will be protected by rules passed under Section 26 of the Act.

These operations will tax the energies of the Department for a series of years, and, until considerable progress has been made in this respect, the more professional work of the Forester can only be attempted on a moderate scale. A fair commencement has, however, already been made by protecting from fire 865 square miles of the more important forests. Planting operations, which had on the 1st April 1883, extended over 40,850 acres, are being pushed on, while the financial results of the Department are fairly satisfactory.

On the whole, it may be said that forest conservancy in Madras has, in the short space of the last three years, been entirely remodelled and put on a satisfactory footing.

43. Forest conservancy has received special attention in Bombay for many years past; and immediately after the passing of the Indian Forest Act, an area of about 15,000 square miles was declared partly reserved and partly protected forests. Although a very considerable area was thus brought under the operation of the Forest Act, this had been done without the necessary enquiries into the rights and requirements of the people living in the vicinity of the forests. Accordingly such an enquiry, in accordance with the provisions of the Act, was set on foot, and it has, during the last five years, occupied a considerable portion of the time of the Forest staff. In addition, as many as six and seven Civil Officers have been

employed on this at one time, besides a number of Civil Officers who attended to it in addition to their ordinary duties. The work is of a very laborious nature, but good progress has been made in it. On the 1st April 1883, the enquiry into and settlement of an area of 5,326 square miles had been finally disposed of, while considerable progress had been made in a large portion of the remaining areas. It is expected that the work will be completed in about three years from this date.

44. The subjects of rāb cutting (*i. e.*, the collection of leaves and shoots for manuring purposes), kumri cultivation, and grazing have specially occupied the attention of the Bombay Government and its officers. Arrangements have been made for a proper rāb supply, without paralyzing forest conservancy, a sufficient area having everywhere been set aside for this purpose. Kumri cultivation is being restricted within reasonable limits, and moreover a fairly successful attempt has been made to combine this method of cultivation with the rearing of useful timber trees. Instead of leasing the grazing in the various forest tracts to speculators, on whom the ryots depended for the grazing, it has been arranged to manage the areas under Government control by levying a fixed grazing fee per head of cattle. This change is described as being a great boon to the people, apart from the fact that it has considerably increased the Government revenue, instead of diverting the money into the pockets of speculators.

In order to assist natural reproduction enormous quantities of seed of useful timber trees have of late years been sown in the Bombay forests; but it has not been possible so far to ascertain the exact results, though they are reported to be favourable.

45. An attempt has been made during the last year to control the illicit distillation of spirits, by collecting departmentally the flowers of the mohwa tree (*Bassia latifolia*). The Government of India did not look with favour on the scheme as the tree grows elsewhere than in the Government forests, and as there might be a danger of interfering with an article of food in years of scarcity; but the experiment was permitted to be carried on for one year, subject to a full report at the end of that time. It is gathered from the proceedings of the Local Government that the result has so far been pecuniarily disastrous.

46. The forest revenue has enormously increased of late years, partly owing to increased requirements of fuel for the Indus Valley Railway, but chiefly in consequence of generally increased demands on the Government forests, brought about by the reduction of private jungles. For years past the private owners have cut down their forests and carried them to the nearest large town and other centres of consumption. In the same degree as these sources begin to fail, the demands on the Government forests must increase.

47. Forest conservancy in Bengal was first commenced in a systematic manner towards the end of 1872. Since then it has made rapid progress, and the management is now at least on a par with that in provinces where operations were started much earlier. As regards the formation of reserved forests, the following figures will illustrate the progress:—

			Area of reserved forests in square miles.
On the 1st April 1873	...	...	106
" 1st " 1880	...	...	2,945
" 1st " 1884	...	...	4,635

48. Since the beginning of 1880, forest conservancy has been extended to the Orissa Division and to the southern part of the Chutia Nagpur Division. In the former the Khoordah forests have been brought under departmental management, and the Angul forests are now being taken up. In Chutia Nagpur the extensive and valuable Sál forests in Singhbhoom have been demarcated and settled. The proposed direct railway from Bengal to Bombay *via* the Central Provinces passes through these reserves, and the measures taken for their reservation will be highly beneficial.

Detailed enquiries have also been made regarding the practicability of bringing the extensive private forests in Chutia Nagpur under better management than they have hitherto enjoyed. This question is, however, as yet pending.

49. The late Inspector General of Forests visited the forests in the Darjeeling and Jalpaiguri Districts in 1879, and submitted a Report on them in November 1880, in which he made suggestions regarding their future management. Some difficulties having arisen regarding the management of the forests in the immediate vicinity of Darjeeling, the present Inspector General enquired into the matter on the spot, and submitted a working-plan for them in April 1882, which has been accepted as the basis for their management. The Inspector General of Forests is now on a tour of inspection in the forests of Chutia Nagpur, which, it is expected, will result in a definite plan for their management being drawn up.

50. The area protected against fire was 661 square miles in 1879-80, and 768 square miles in 1883-84. The area of plantations has increased from 941 to 2,568 acres during the last five years.

The financial results were as follow :—

		Receipts.	Surplus.
		Rs.	Rs.
In 1879-80	...	4,49,524	1,73,777
„ 1883-84	...	6,94,334	3,06,521

51. In the North-Western Provinces and Oudh forest conservancy Forestry in the North-Western Pro- was commenced at a comparatively vinces and Oudh. early date, hence the progress during the last five years is perhaps not so marked as in some of the other provinces, where operations were commenced at a later date. Steady progress has however been made. One of the most important measures carried out during the last five years is the acquisition and consolidation of 85 square miles of forest lands in the Banda District, while an additional area of 33 square miles has been taken under management, the private co-sharers receiving a proportion of the net income. These are steps in the right direction, as forest lands in Bandelkund are on the decrease.

The operations in connection with the Dehra Dún Forest School have already been mentioned. Special care and attention has, during the last five years, been bestowed upon the improvement of the management of the School forests.

In one part of a Forester's work the North-Western Provinces and Oudh are much ahead of any other province, namely, in the construction of roads, of which a considerable number of miles are constructed annually. The preparation of working-plans has also received special attention of late years.

52. The late Inspector General of Forests visited most of the forests during the early months of 1881, and submitted an exhaustive report on them in November of the same year; the suggestions contained in it have since then guided the local authorities in the management of these forests.

The present Inspector General visited the Central Circle in 1884, and discussed and submitted a re-organization of the Subordinate Staff, which has been accepted by Government. The main principle of the new organization is, that all the forests shall be grouped in Ranges of suitable size, the work in each Range, or executive charge, being entrusted to a specially trained Ranger.

53. The area of reserved forests has during the last five years been increased from 3,279 to 3,380 square miles, that of areas protected from fire, from 661 to 874 square miles, and plantations from 2,262 to 3,718 acres.

The financial results were as follow :—

	Receipts. Rs.	Surplus. Rs.
In 1879-80	10,39,966	3,23,372
„ 1883-84	16,11,382	5,69,493

Many of the forests in the North-Western Provinces and Oudh were considerably overworked in former years, owing to their position on the edge of an enormous almost forestless plain. These forest estates are, however, very valuable, and their financial importance will steadily increase.

54. The formation of permanent forest estates was, some five years ago, in a very backward state. Efforts have been made of late years to push on this work; but the difficulties in the way were very great. However some progress has been made, as will be seen from the following data :—

	Area of reserved forests. Square miles.	Area of protected forests. Square miles.
On the 1st April 1879	795	...
„ 1st „ 1884	1,398	811

Much remains to be done in this respect.

The forests in the Native States of Chamba and Bashahr were leased by the British Government 20 years ago. Efforts were made during the last few years to secure the forests in several of the small hill states near Simla, but with very limited success.

55. The question of the treatment of the Hoshiarpur chôs or drifts has received much attention. The hills from which the chôs descend have, owing to cutting and excessive grazing, been almost completely denuded of all growth, and as they consist of exceedingly friable material, large masses of debris are annually carried into the plains at their foot, there forming regular sand torrents, which have not only ruined extensive tracts of cultivated land, but even carried away a portion of the town of Hoshiarpur and of several villages. The evil has been permitted to attain very considerable dimensions, the loss of land revenue alone amounting already to about a lakh of rupees annually. However, the matter is now under serious consideration, and it is expected that effective steps will shortly be taken to counteract the further desolation of cultivated lands. Probably the best plan would be to buy out the few inhabitants and graziers, who live in those hills, and bring the land under forest. Such a measure, apart from the fact that it is necessary on general grounds, is even likely to be financially successful, as the hills overhang a large extent of country bare of forest.

56. A measure which caused some trouble was the settlement of the drift timber arrangements on the Jhelum river. A settlement was ultimately effected by declaring that the British Government and the Maharajah of Cashmere shall collect drift timber on their own parts of the river. A solatium of Rs. 60,000 was, however, paid to the Maharajah to compensate him for the loss of revenue hitherto enjoyed.

Forestry in the Punjab.

Nearly the whole of this sum has been recovered during the last two years, owing to exceptional floods on the Jhelum and improved arrangements for the catching of drift timber.

57. The late Inspector General of Forests drew up a Report on the Bashahr forests in 1881, this being the third Report on these forests prepared by Mr. Brandis. These important Deodar forests have now been worked on the lines of his proposals for 20 years, with the most beneficial results.

The present Inspector General of Forests was deputed to Kulu in 1882, in connection with the question of the treatment of the Deodar and other forests in that District. He submitted a Report, in which he proposed that about 80 square miles of Deodar localities should be set aside as reserves, while the remaining forests, about 320 square miles, should be preserved with the assistance of the village head-men, but under the control of the Forest Department, for the benefit of the inhabitants. His proposals were only partially accepted by the Local Government, who have substituted a system, under which the forests are to be arranged in four different classes, with different rules for each. Such a complicated system is not likely to work in practice, and it will no doubt, after a fair trial, be considerably modified.

58. The area of plantations has, during the last five years, been increased from 17,870 to 18,563 acres. Vigorous efforts are now being made to increase the future supply of Deodar by planting it extensively in the most suitable localities. The progress in the financial results is as follows :—

	Receipts, Rs.	Surplus, Rs.
In 1879-80	6,49,819	1,69,143
„ 1883-84	9,10,177	2,57,031

The Punjab has more than any other province profited by the education offered to Forest Officers at Dehra Dún, and the wisdom of this move is already becoming apparent in the improvement of the Executive Staff.

59. All waste lands at the disposal of Government in the Central Provinces were declared reserved forests under the Indian Forest Act in 1879. The area amounted in that year to 19,383 square miles, and since then the changes have been insignificant. Of this area 2,501 square miles were classed as first class reserves, that is to say areas under strict conservancy; while the rest, or 16,882 square miles, were called second class reserves, or areas in which a certain amount of cultivation was permitted, and in which a more lenient conservancy generally is practised. The first class reserves are fairly well demarcated, but the boundaries of the second class reserves are in an unsatisfactory condition. Accordingly much time and labour has of late years been bestowed upon the more complete demarcation of the latter, with the view of transferring all important parts to the first class reserves, and of giving up certain parts permanently for cultivation. Some progress has now been made in this matter and the transfers have commenced, but it will take some years yet to complete the business. It has been recognised that this is the most urgent part of the Department's work.

60. The Central Provinces were repeatedly visited by the late Inspector General of Forests, who drew up a detailed Report on the management of some of the more important areas in 1876, and left copious notes regarding others.

The present Inspector General of Forests visited the Central Provinces in the winter of 1882-83, and drew up a Report on the

- management of the forests, which is dated the 1st June 1883. After giving a general sketch of the forests, it deals with the Areas and Boundaries of the reserves, the Organization, Protection of the Forests, Cultural Operations, the Working of the Forests and the Financial Results. As regards areas, &c., it gives the following data:—

				Square miles.
Assessed cultivated area	...	...	...	22,095
" grazing lands	...	...	...	2,937
Area of private forests	...	...	...	34,937
" of Government forests	...	...	...	19,719
Other areas	...	...	...	4,757
Total area				84,445

The area of the Government forests represents 23 per cent. of the total area, while the private forests contain 16,482 square miles of unculturable waste, representing 20 per cent. of the total area. The population amounted to very nearly 10 millions, and it had, according to the last Census, increased at the rate of 25 per cent. in nine years, so that its doubling during the next 40 or 50 years is by no means impossible. The private forests, which now comprise 34,937 square miles, are rapidly disappearing under the axe and the plough, and considering that, even now, the demands on the Government forests are already great, it follows that they will be enormously increased, as the population increases and cultivation is extended. Hence it is essential that the area of Government forests should not be reduced below 20 per cent. of the total area, and these should all be managed as first class reserves, if it is desired to provide the necessary forest produce for these inland provinces.

61. The Chief Commissioner has lately taken up the question of the Zemindari forests, and in a Memorandum of the 21st September 1883, has drawn attention to their rapid destruction, chiefly in consequence of Railway extension. He has called for information on a variety of points, with the view of considering what steps shall or can be taken in order to arrest the further destruction of the forests. These measures may help to retard the evil, but the only satisfactory remedy will be found in the systematic conservancy of the Government forests.

62. Fire protection has made more progress in the Central Provinces than in any other province; the area under protection amounts now to 1,366 square miles, against 1,118 square miles in 1879-80.

The financial results compared with those of five years ago are as follow:—

		Receipts.	Surplus.
		Rs.	Rs.
In 1879-80	...	10,06,723	4,84,150
" 1883-84	...	9,94,769	5,53,712

63. It has already been stated that the Burma Forest Act was passed in 1881, and that Rules were promulgated under several of its sections.

The late Inspector General of Forests made an extended tour in Burma in the beginning of 1880, and submitted a detailed Report on Forest Administration in that province in January 1881.

64. As far as India is concerned, Burma is the principal source of teak timber, which may justly be called the prince of woods. It combines in a remarkable manner many useful qualities, hence its employment for a variety of purposes in Europe, India, and other countries is steadily extending. Teak has held its own against all wood exported from North and South America, and against those which have been discovered in Australia and South Africa. Although

Forestry in British Burma.

the export of teak from Bangkok has considerably increased of late years, sufficient is known of the sources of the teak supply, to make it clear that Burma must remain the principal source for the export of timber. To give an idea of the importance of this trade it may be mentioned that in 1882-83 no less than 151,151 tons were exported, which represented a value of Rs. 1,40,46,610. This timber, together with that used in the province, comes partly from forests situated in British Burma, but chiefly from forests situated beyond the frontier. The proportion may roughly be taken at present as 1 to 4; in other words only about one-fifth of the teak comes at present from British forests. Considering that the forests beyond the frontier are not subject to conservancy measures, their resources must be exhausted in course of time; the great importance of the British forests becomes, therefore, at once apparent. Hereafter they will have to supply as much timber as is now derived from all sources, or else the supply of this important commodity must fall off.

This fact does not seem to have been fully realised until comparatively lately, and in consequence all attempts at forest conservancy in British Burma had to face a most determined resistance on the part of the timber dealers, whose only object was to become rich as quickly as possible. Although, therefore, conservancy was started comparatively early, it is only of late years that the proper demarcation and settlement of reserves or permanent forest estates have made good progress. In 1879-80 the area amounted to 1,612 square miles, while it had risen to 3,758 square miles on the 1st April 1884. Further additions are contemplated.

65. Another point of difficulty in this respect consisted in the fact that most of the valuable teak localities are inhabited by Karens, a wandering tribe, who cut down a fresh piece of jungle every year, burn it and cultivate the site, and then abandon it. This difficulty has of late years been overcome by assigning to each village, or a number of villages, a certain defined area within which the inhabitants may cut their taungyas, or hill gardens. These blocks are in many instances situated within the boundaries of the reserves. Upwards of 400 square miles have up to date been assigned in this manner.

66 The area of plantations has, during the last five years, risen from 5,904 to 13,415 acres, and this has been possible by enlisting the service of the Karens, who are permitted to cut taungyas in certain localities under the condition that they plant teak with their crops. In this manner it is hoped to assist natural reproduction at a reasonable outlay, and to multiply the production of teak to such a degree, as to be able to meet the rising demand on the forests.

Less progress has been made in fire protection, the protected area having risen during the last five years from 151 to 261 square miles. As soon as the demarcation and settlement of reserves has been completed, fire protection will receive more extended attention.

67. The Receipts and Surplus derived from the British Burma forests show excellent progress, as will be seen from the following data:—

		Receipts.	Surplus.
		Rs.	Rs.
In 1879-80	...	11,80,190	4,26,700
„ 1883-84	...	25,09,275	12,91,452

Until the 1st January 1882 a duty of 7 per cent. *ad valorem* was levied on all timber imported into British Burma by the Salween river. From the above-mentioned date it was reduced to 1 per cent., and subsequently to $\frac{1}{2}$ per cent., an amount sufficient to cover the expenses of controlling the timber operations on the Salween. But for this reduction the receipts and surplus would have been $2\frac{1}{2}$ lakhs of rupees more than they were in 1883-84.

Generally speaking the Burma forests are the most valuable in India, and they must be most carefully looked after, not only for the sake of the considerable revenue they yield to the State, but also in order to perpetuate a sufficient supply of teak timber to India and the world generally.

68. After a lengthy discussion a liberal concession was given to a Mr. Routledge in 1882, for the conversion of bamboos into paper pulp, but up to date nothing has come of it. It seems, however, likely that bamboos, of which Burma possesses an immense wealth, may some day become of special importance in this respect.

69. Owing to the climate of Assam being specially adapted for the cultivation of tea, forest conservancy is of greater importance in this province than would otherwise be the case. As yet Assam has a large area of forests, but in the more accessible districts it has already been sadly reduced. Hence the demarcation of reserves has been pushed on of late years. The area stood at 2,015 square miles in 1879-80, and it is 2,314 square miles now.

Fire protection has made some progress, the protected area having risen from 144 to 148 square miles during the last five years.

70. The area of plantations has during the same period risen from 1,088 to 1,296 acres. Of the latter area 1,023 acres are stocked with *Ficus elastica*, the Assam India rubber tree. Assam and the surrounding districts are the home of this tree, which is the source of a considerable export, amounting to some 600 tons per annum, valued at 12 to 13 lakhs of rupees. The mode of tapping the Rubber trees is generally most wasteful, and as they are scattered over a very wide extent of country, it has been found impossible to protect them. All that can be done is to derive a revenue from existing sources, and to establish, with the proceeds, compact plantations in the most favourable localities. This policy has lately been urged upon the Chief Commissioner of Assam by the Government of India.

71. The receipts and surplus of the Assam Forest Department in 1879-80 compare thus with those of 1883-84:—

	Receipts. Rs.	Surplus. Rs.
In 1879-80.	1,64,336	31,506
„ 1883-84	2,11,445	11,883

Railways are now beginning to make their way into Assam, and with their progress the returns from the forests are likely to increase considerably. In the case of the Makum line a so-called timber concession has been given, by which the Railway has received, in one year, wood valued at Rs. 83,538. It is undesirable to grant such undefined concessions in future.

72. Forest conservancy in Coorg has made steady progress during the last five years, but no stirring events have occurred. Demarcation has been proceeded with; measures have been taken for the preservation of the Devara Kadus or "sacred groves;" the construction of a tramway from the Nalikeri forest to Hunsur (in Mysore) has been considered, and a part of the line has been sanctioned.

73. The waste lands and hills in the Government villages of Ajmere and Merwara were originally the absolute property of the State, but at the settlement of 1850 they were included in the Shamlat or common land of the villages, under the condition that villagers themselves would plant trees and preserve the jungle to a reasonable extent.

Forestry in Ajmere.

This engagement they never attempted to keep, and as the lands became gradually denuded, pasture failed, wood became scarce, the water-supply in wells and streams became uncertain, and the smaller tanks were silting up at an alarming rate. It was decided in 1871, in consequence of proposals made by the Inspector General of Forests, on the occasion of a new settlement, to acquire for forest purposes certain areas on the hills of these Districts. For this end the Ajmere Forest Regulation of 1874 was passed, under which lands can be taken up, certain rights being secured to the villages. In this way 101 square miles had been taken up in 1879-80, and placed under systematic management and protection.

74. In December 1878 the Inspector General visited Ajmere and Merwara, and submitted a Report on the forests in these Districts in November 1879, in which he gave a general account of the forests and described the advantages expected from their protection. Since then the forests have been managed on the lines laid down in that report. The area of the reserves has now been increased to 139 square miles, and some further extensions are contemplated. Numerous experiments to test the effect of forest protection on the rainfall, humidity, dew, temperature, drainage, water-supply in wells, springs, streams and tanks have been started-lately; in short, Ajmere has been selected as an experimental area, and the results of the observations and measurements will be of the greatest interest as regards the effects of forest conservancy generally.

One point has already been settled, and that is the considerable improvement in the production of grass due to protection.

• Though the forests do not yet pay for their management, the Receipts are gradually rising; they were Rs. 1,861 in 1879-80 and Rs. 8,198 in 1883-84.

75. The Andamans were botanically explored by the late Mr. S. Kurz, and the vegetation described by him in a Report published in 1870. Forestry in the Andamans. Subsequently, in 1874, Mr. A. L. Home, Deputy Conservator of Forests, visited the country in the vicinity of Port Blair and reported on its timber resources.

76. Forest operations were commenced some years ago, in order to supply the Settlement with the necessary timber, and gradually an attempt was made to bring the more valuable species of timber into the Indian and Home markets; and as the operations promised to become of importance, a trained Forest Officer was set aside for the Andamans in 1882. The islands are said to be rich in timber, of which Padouk *Pterocarpus indicus* is the most important. The latter has been introduced into the Calcutta market, chiefly as scantlings, and it has also been sent home. Arrangements have lately been made to supply the Indian Telegraph Department with posts, while sleepers have been sent to the Indian Railways for some years past.

The Forest Officer is now engaged in a detailed examination of the timber resources of the islands, while further attempts are being made to extend the export.

77. The necessity of forest conservancy in Biluchistan made itself felt as soon as the District came under British control. Accordingly Forestry in Biluchistan. a Forest Officer has been temporarily entertained since 1880, who took under conservation certain tracts situated in the vicinity of Sibi. During the last two years more vigorous action has been forced upon the Government by the scarcity of forest produce in the vicinity of the military stations, and in 1883 a specially qualified Forest Officer was deputed to report on the whole subject. It has thus come to light that, while an area of 200 square miles of Juniper forests are

Forestry in Biluchistan.

available near Ziarat, the existing sources in the vicinity of Quetta will not yield more than twelve years' supply of forest produce for that station. It has therefore been decided to post a trained Forest Officer to Biluchistan, whose business it will be to manage the existing natural forests in Ziarat and near Sibi, and to make considerable plantations in the vicinity of Quetta and other military stations. The Railway now under construction from Sibi to Quetta will also require large quantities of timber and fuel, and no time must be lost in pushing on forest operations.

78. Up to the year 1879-80 an area of 1,358 square miles had been declared Reserved or State forests under the existing Forest Rules, while 2,977 square miles were classed as District forests.

It has already been mentioned that a new Forest Regulation has been under consideration for some time, and that it is likely to become law before the end of the current year. In the meantime much time and trouble have during the last few years been devoted to the re-classification of all waste lands by dividing them into—

- (i). Wood lands.
- (ii). Grass lands.
- (iii). Grazing grounds.
- (iv). Lands available for the extension of cultivation.

79. The present Inspector General of Forests visited Berar in spring 1883, and in his Report showed that the general distribution of lands is as follows:—

	Area in square miles.
Cultivated	11,346
Culturable waste	1,713
Unculturable waste	4,652
Total	<u>17,711</u>

About two-thirds of the land are under cultivation. It is estimated that an area of 4,000 square miles under forest, or about one-fourth of the total area, is necessary for the requirements of the province, and as the total area at the disposal of Government amounts to 4,424 square miles, it is evident that only limited portions of it can be made available for further extension of cultivation.

80. The area of reserves has now been increased to 1,635 square miles. The organization has lately been perfected by connecting the Forest Officers with the Civil Officers. The area protected against fire has, during the last five years, risen from 716 to 972 square miles, and the area of plantations from 1,504 to 2,600 acres. The receipts are about the same now as they were five years ago, while the surplus is somewhat lower.

The Melghat reserves, covering an area of 609 square miles, are most valuable estates, which have been very considerably improved during the last five years by fire protection, planting, the construction of roads, &c. They will yield a gradually increasing revenue, which is sure to be hereafter a multiple of what it is now.

81. The Government of India has taken advantage of every opportunity to encourage forest conservancy in Native States and abroad.

In 1881 Mr. Brandis advised the Kapurtalah State regarding their forests in Oudh. A superior Forest Officer of the staff under the Government of India is at this moment Conservator of Forests in Bewah. A Forest Ranger has been made over to Oodeypore.

Forestry in Native States and Abroad.

Several men sent by Native States are now under training at the Dehra Dún Forest School. It is satisfactory to notice that the importance of forest conservancy is being recognised in all the better governed Native States.

82. During the last five years the Government of India has assisted the Governments of the Mauritius, Ceylon, Cyprus, and the Cape, to all of which places Indian Forest Officers were lent for the purpose of advising them on forest conservancy, or of assisting them to carry it into effect.

83. The following data shew the progress made during the last five years in the formation of reserved forests, fire protection, and plantations, with the financial results, in the provinces under the Government of India :—

	YEARS.	
	1879.	1884.
Area of reserved forests (in square miles) ...	31,785	36,922
Area protected against fire (" ") ...	3,710	4,779
Area of plantations (in acres) ...	30,565	43,456
Receipts ...	Rs. 49,01,744	73,40,326
Surplus ...	„ 17,93,528	31,10,035

84. The financial results in the three presidencies were as follow :—

Presidency.	Receipts.		Surplus.	
	1879-80.	1883-84.	1879-80.	1883-84.
	Rs.	Rs.	Rs.	Rs.
Bengal ...	49,01,744	73,40,326	17,93,528	31,10,035
Madras ...	3,65,750	9,58,991	—15,478	2,13,489
Bombay ...	15,24,712	25,03,100	4,68,399	10,17,111
Total ...	67,92,206	1,08,02,417	22,46,449	43,40,635

The Receipts have, during the last five years, increased by 40 lakhs, and the net Surplus by 21 lakhs of rupees. Expressed in pounds sterling, the receipts amount roughly to one million pounds, and the net Surplus, after meeting cost of establishments, working, protection, and improvement, to four hundred thousand pounds.

General Results.