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ADDENDA AND CORRIGENDA.

- Page 7.*—In the last line of section 19, strike off the first word 'they'.
- Page 15.*—In the penultimate line, for 'bands' read 'bends'.
- Page 19.*—In the last line for 'rafters' substitute 'scantlings'.
- Page 21.*—In the last line of clause (iii) (a), strike off 'advance'.
- Page 25.*—In line 8 of section 69, insert a hyphen between the words 'ill grown'.
- Page 26.*—In line 4 of section 71, for 'shoul' read 'should'.
- Page 41.*—In line 2 of clause (e), insert 'that of' between the words 'as those'.
- Page 56.*—In line 5, strike off the first word 'the'.
- Page 58.*—In line 2 of section 141, insert a hyphen between the words 'well being'.
- Page 59.*—In line 1, insert a comma after 'caught'.
- Page 61.*—In the penultimate line, insert a comma between the words 'and when'.
- Page 66.*—In line 4, for 'were' read 'are'.
- Page 70.*—In line 6 of section 154, for 'eleborate' read 'elaborate'.
- Page 75.*—In lines 2 and 12 of section 162, insert a hyphen between the words 'fire traced' and 'water carriers' respectively.
- Page 77.*—In the first line of clause (2) of section 171, insert 'the' after 'longer'.
- Page 79.*—In the last line of section 25 (ii), for 'forests' read 'Forests'.
- Page 96.*—In line 2 of section 191, insert a comma after 'Officer'.
In line 1 of section 192, insert a comma after 'subordinate' and in line 2, one after 'temporarily'.
- Page 106.*—In line 13 of section 226, strike off the comma after 'sums'.
- Page 107.*—In the heading of section 229, place the apostrophe after, instead of before 's' in the word "contractors" and in line 9, a hyphen between the words 'over payment'.

INTRODUCTION.

THIS Manual is intended for the use of all forest subordinates in the Bombay Presidency including Sind.

Its object is to indicate plainly the course of action of each class of officials and convey a clear and complete knowledge of their powers and duties with a view to increase their efficiency.

It is recognized that general orders applicable to the whole of the Presidency do not necessarily apply to every part of it in detail. It is therefore left to the Divisional Forest Officers to issue supplementary orders to suit the peculiar conditions of particular divisions in regard to minor details according to necessity, provided that such orders do not infringe the standing orders of higher authority.

In the absence of any special supplementary orders these orders must be strictly followed by subordinates.

In compiling this Manual the Standing Orders prepared by the Senior Conservator after special detailed inspection of all subordinate forest offices in one circle (the Southern) in advertence to Government Resolution No. 51 of 4th January 1911 and Resolution XXV of the Forest Conference of 1913 (Government Resolution No. 2639 of 20th March 1914), the Burma Manual of Standing Orders for Forest Subordinates, the local Standing Orders of Conservators and the book of Government Standing Orders have been consulted.

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Chapter and its title.	Range Officer.	Round Officer.	Beat Officer.	Sylvicultural Officer.	Surveyor.	Girdling, marking, Reservation Officer.	Felling Officer.	Depôt Officer.
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CHAPTER I.

ESTABLISHMENT.

1. *Forest charges.*

1. A forest circle is a group of divisions ; a division is divided into ' ranges ', a range into ' rounds ' and a round into ' beats '. It is the duty of every Forest Officer to know his area of patrol thoroughly. He should possess a handy map showing such area.

2. *Classes of subordinate officers.*

2. (i) A ' Range Officer ' is any Forest Officer in charge of a range, a ' Round Officer ' one in charge of a round and a ' Beat Officer ' the guard in charge of a beat.

(ii) Technical Officers are :—Sylvicultural Officer, Surveyor, Girdling, Marking and Reservation Officer, Felling Officer, Depôt Officer.

3. *Duties of subordinate officers.*

(a) General.

3. The officers of the above descriptions shall—

(i) act in subordination to and in accordance with the orders of the Divisional Officer ;

(ii) discharge their duties in conformity with the Manuals, Acts, Rules and Standing Orders that have been or may be enacted from time to time relating to the Forest Department ;

(iii) visit all forests within their respective charges and keep a strict watch on the proper conservancy of the forest ;

(iv) see that the boundary marks are in proper condition ;

(v) report promptly any occurrence affecting the welfare of trees, people and animals ;

(vi) make enquiries and seize the forest produce in accordance with the rules in force in the event of any forest offence being committed, keeping in view the penalties of section 61 of the Indian Forest Act for wrongful seizure ;

(vii) keep a strict watch that the forests in their respective charges are not injured by fire ;

(viii) see that cattle do not trespass in closed forest areas and do not graze in any open area without fees paid in accordance with the rules in force ;

(ix) exercise proper supervision on the removal of forest produce by Government agency, consumers or purchasers, free grantees and by privilege or right holders.

(b) *Special.*

4. The Range Officer is responsible for the efficient management of his range, the condition and proper custody of all Government property and the discipline of all forest subordinates in his charge. He must see that each understands and attends to his duties. He should explain to them the rights and privileges of villagers existing, if any, in the forest, the legal actions to be taken when necessary under the Forest and other Acts and the silvicultural works as detailed in Chapter IV of this Manual.

5. The Round Officer is responsible for all work in his round. He should instruct the Beat Officers in all their duties, see that they know their forest boundaries and for the uneducated write up their diaries whenever he meets them and read to them their book of rules. He should see that they go about their jungles, and he should inspect their diaries from time to time and report any negligence on their part. The following Beat Officers' duties are equally applicable to Round Officers.

6. The Beat Officer's duties are : He shall—

- (1) protect all forests in his beat ;
- (2) repair and paint forest boundary marks, keep free of growth all boundary marks which have once been cleared ;

(3) see that the rights and privileges existing, if any, in the forests are not infringed by the villagers ;

(4) prevent illicit cutting of trees by constantly moving about the beat ;

(5) see that cattle are not grazed in closed areas ; if habitually kept under control and through accident they have strayed, warn the owner to be more careful of them in future ; and, if not properly cared for by their owner and allowed to pick up a subsistence by pilfering food or if deliberately driven into such areas, impound them ;

(6) see that the prescribed fees are paid for grazing in open areas and if not paid take the trespassing cattle to village officers for levying the fees ;

(7) frequently inspect fire stations or climb a tall tree to look out for fires in the fair season, burn fire lines in good time, collect villagers and put out forest fires in the event of their occurrence and prevent kindling or leaving burning of fire upon public or private way in reserved forests ;

(8) detect and report illicit shooting and fishing in reserved forests ;

(9) see that forest produce is not carried beyond the limit of the village, in which it was produced, without a pass ;

(10) collect timber found adrift, beached or sunk ;

(11) carry out silvicultural works, such as sowing seeds, planting and other cultural operations as ordered, cutting creepers, collecting seeds of important trees, preparing nurseries, making petty repairs to plantation and nursery fences without special orders ;

(12) keep the forest post house in his charge together with the compound in repairs, clean and tidy and generally protect the same from damage ;

(13) submit first report immediately on discovery of a forest offence, try to trace the offender and, if found, take him to the nearest police station within 24 hours and give necessary help to the Round Officer while conducting the enquiry.

4. *Discipline and conduct.*

7. No subordinate may proceed outside the limit of his charge except—

(i) when going from one end to another of his charge by the shortest route ;

(ii) when going to the ' bazaar ' town on the day fixed by the Divisional Officer ;

(iii) when ordered by a superior officer ;

(iv) when summoned by a court ;

(v) when tracing stolen property or in pursuit of an offender ;

(vi) when proceeding to superior officer in case of sudden necessity for leave of absence.

Proviso : (a) when leaving his charge under authority of exceptions (i) and (ii) no officer is to stop outside his jurisdiction during the night except in the case where the ' bazaar ' town or other place, which he has authority to visit, is over 10 miles from the nearest village of his charge. In the other exceptions he will stop as long as the circumstances compel him to and no longer ;

(b) summons issued on any subordinate will be served through the Round Officer, who will arrange for the duties of the subordinate summoned being carried out during his absence. When the period of absence exceeds 5 days, the subordinate shall report to the Divisional Officer for orders ;

(c) under exception (vi) a Range Officer can make a petition in person to the Divisional Officer only when the latter is encamped within 6 miles from his jurisdiction, otherwise by post ; a Round Officer should make it similarly to the Range Officer and a Beat Officer should always make it in person to the Round Officer or to the Range Officer when the latter happens to camp within the round in which the beat is situated. The Range Officer will obtain the sanction of the Divisional Officer in each case in which he is not authorized to grant the leave himself.

Any officer who leaves his charge before such sanction will be liable to dismissal.

8. Beat Officers should ordinarily not be employed outside their beats without reference to the Divisional Officer.

9. If a Range Officer thinks that a Beat Officer could be more usefully employed temporarily outside his beat, he should usually ask permission of the Divisional Officer beforehand, stating the reason and probable time he will be required elsewhere ; but may in case of emergency act on his own authority, provided he at once reports the matter with reasons.

10. Subordinates wishing to resign must give at least one month's notice and await orders from the Divisional Officer before leaving the work with which they are entrusted. Disobedience of these orders renders them liable to dismissal.

11. When a subordinate ceases to belong to the Department all Government property in his charge including his uniform must be taken over by the Range Officer.

12. The exact date, forenoon or afternoon, must at once be reported in the case of a subordinate, newly appointed, proceeding on leave, returning from leave, removed, dismissed, suspended, etc.

13. Severe penalties (reduction, removal or dismissal according to circumstances of the case) will be imposed on subordinates found—

(i) withholding pay or travelling allowance or wages without the Divisional Officer's sanction ;

(ii) falsifying diaries or other documents ;

(iii) allowing other persons access to records or other Government papers in their charge without permission from their superiors.

14. The Government Servants' Conduct Rules given in appendix III of the Bombay Forest Manual, Volume I, should be strictly observed by all forest subordinates. Special attention is drawn to those sketched below :—

A Government servant may not—

(i) accept any gift, gratuity or reward from any native of India ;

(ii) receive any complimentary or valedictory address ;

- (iii) accept any testimonial presented to him ;
- (iv) attend any public meeting or entertainment held in his honour ;
- (v) receive any trowel, key or other similar articles offered to him at a ceremonial function ;
- (vi) lend money to any person possessing land within the local limits of his authority ;
- (vii) borrow money from, or otherwise place himself under a pecuniary obligation to, any person subject to his official authority, or residing, possessing land or carrying on business within the local limits of his authority ;
- (viii) speculate in investments ;
- (ix) communicate to Government servants belonging to other Departments, or to non-official persons, or to the press any document or information which has come into his possession in the course of his public duties ;
- (x) take part in or subscribe in aid of any political movement or attend any political meeting.

Insolvency and habitual indebtedness renders a Government servant liable to dismissal.

15. In the event of serious misconduct on the part of one of his subordinates, the Range Officer should relieve him of all Government property in his possession, instruct him to stay at his head-quarters and at once report for orders to the Divisional Officer.

16. Suspension is equivalent to arrest on parole and not to time on leave as is the idea generally. A subordinate under suspension, therefore, is not at liberty to leave his post any more than he is when on duty. If, without permission of the officer who suspended him, he leaves the limit of his charge he will be considered as 'absent' without leave. Absence without leave constitutes a breach that entails forfeiture of all past service.

17. All correspondence connected with work in his range should go through the Range Officer and his subordinates may only address the Divisional Officer through him.

18. Range Officers may not take petitions from villagers addressed to themselves. Petitions should only be accepted for forwarding to the Divisional Officer.

19. In forwarding petitions Range Officers should make such notes or remarks as are necessary to enable the Divisional Officer to pass orders without further reference. When villagers ask regarding privileges, etc., to which they are entitled they should be told the rules on the subject.

20. All supplies taken from villagers must be paid for promptly and in full.

21. Due respect must be paid to officers of other Departments. Every opportunity should be taken to call on superior Government officials of all Departments that are on tour in the charge of any officer.

22. Guards when meeting their superiors are to stand up straight and make a military salute and are not to bend their backs, necks or knees and go through other movements calculated to bring ridicule on Government uniform, and Range Officers will be held responsible that their subordinates know how to salute and wear their uniforms and equipments.

5. *Leave of absence.*

23. Sickness or inability to work must be at once reported.

24. If the ailment is likely to last more than 5 days the subordinate should proceed to the nearest hospital, reporting that he has done so, and should not return to duty until he produces a medical certificate of fitness.

25. Leave granted to subordinates must be taken immediately on receipt of the order unless the order specifies a date from which the leave takes effect. If a subordinate does not wish to avail himself of leave promptly, the order granting the leave should be returned for cancellation.

26. If any officer desires to extend his leave, he must, at least seven days before his leave expires, forward a registered letter with address, if a Range Officer to the

Divisional Officer or if a Round Officer or Beat Officer to the Range Officer and give full reasons for asking extension; failing this and not returning he will be liable to be superseded.

27. If the extension is not sanctioned the officer will be considered on leave without pay from the expiry of his original leave until he returns, and if he does not return in seven days of receipt of reply he will be superseded. No excuse for delay will be accepted unless accompanied by a medical certificate.

28. As the services of the protective establishment are most needed during the fire season, *i.e.*, from 1st February to 31st May, no privilege or casual leave shall be granted to any member of that establishment during the above period, except under very exceptional circumstances or when the application for leave is accompanied by a medical certificate.

6. *Transfers.*

29. Persons whose transfers are ordered must hand over charge of their duties within three days of the receipt of the order to their immediate senior officers unless specifically directed to remain until relieved by their successors.

30. The orders of transfer should be regarded as final. If the subordinates concerned have any complaint to make they may make it, but in the meantime must obey the orders.

31. An officer who does not join his new appointment within his joining time is entitled to no allowances after the end of his joining time and, after a week, ceases to have a lien on any appointment. The excuse that he was unable to obtain the charge within the liberal intervals of joining time allowed shall not be accepted. Every relieving officer is responsible for informing the officer to be relieved at the earliest possible moment of the date when he will be in a position to receive the charge and it is the duty of the officer to be relieved to be in readiness to deliver charge on that date.

7. *Use and custody of uniforms.*

32. All subordinates must wear uniform and carry a serviceable 'koita' and a marking axe when on duty.

Private kit such as dhotars, umbrellas, etc., are not to be used when wearing uniforms. Under-clothing is not to be visible and the uniform is not to be cut or altered to fancy of wearer.

33. When appearing in courts or public places or before their superiors they must invariably wear the last issue. Any neglect in this respect will be punished.

34. When doing rough work in the forests they need not wear uniform but it must be with them in camp.

35. Uniform must be worn tidily and the buttons and accoutrements kept clean.

36. (i) Every officer shall when going on leave, other than casual leave, deposit his uniform, equipments, etc.; if Beat Officer with the Round Officer and if Round Officer or Range Officer in the range forest office taking receipt for the same in the usual charge form.

(ii) No substitute will use any portion of the absentee's uniform but the belt in the case of a Beat Officer.

37. In the case of transfer of subordinates the men should take their uniform buttons with them. Distinctive marks on the uniforms shall only be the property of the individuals as long as they occupy the grade they are in at the time of first receiving them. In the case of promotion or reduction they shall be returned to the Divisional Officer and redistributed.

38. Subordinates are strictly prohibited from disposing of articles of uniform or Government clothing however old they may be.

8. Diaries.

39. All subordinates will keep diary books in the prescribed form in which full but concise details of work done or inspected with the results of inspection must be given.

40. All subordinates except Beat Officers will submit their diaries to the Divisional Officer punctually on the 8th, 15th, 23rd and last day of the month. They will be prepared from and must agree with the diary books. No other copy of the diaries should be kept.

41. The following rules must be observed in respect of Beat Officers' diaries:—

(i) Beat guards will be supplied with stamped diary books by the Range Officer. Before supply the Range Officer shall write on the fly leaf over his signature:—

(1) The names of all the forest villages in the beat.

(2) The forest survey Nos. and areas open and closed in each village (a) to privileges and (b) to grazing.

(3) The bazaar town of the beat and the day on which it is to be visited.

(4) The number of days allowed for the visit to the bazaar.

(5) The headquarters of the beat.

(ii) The Beat Officer must always keep the diary book on his person, and it shall be in the form prescribed at present.

(iii) Whenever the Beat Officer meets the Round Officer or any other superior officer he shall produce his diary book. The Round Officer and the Range Officer shall on every such occasion read and sign the diary book and date it below the last entry, with any remarks that may be necessary regarding the place where he was met, the reports, if any, made by him and his work and forests in general.

(iv) Beat Officers should if possible get the Patil or Kulkarni's signature on their diary when stopping the night in any village.

(v) Beat Officers who cannot write must get the diary book written up by some body, preferably village officers, Naka Karkuns, or Round Officers; and Naka Karkuns and Round Officers shall, on application, at once write up the diary to date as dictated by the Beat Officer. Range Officers must also complete the Beat Officers' diary in places where the writers are not to be found.

(vi) Beat Officers who can write must fill in their diaries daily.

(vii) Beat Officers are not to submit diaries.

42. All offences and important matters noted in diaries must be reported separately.

43. When submitting diaries of subordinate officers, the Range Officer will note whether the work done during the period was satisfactory and will mark any portions that they think the Divisional Officer should read.

44. Range Officers should spend the greater portion of their time in the various parts of their charge away from headquarters and not content themselves generally with riding or bicycling out to inspect their works and returning to headquarters in the course of the day. The latter practice renders effective supervision of the forests impossible and hardly affords occasion to the Ranger to learn anything about the conduct of his men and maintain intimate relations with the people. More particularly in the matter of fire protection his influence would be much greater and more effective if he spent two or three days at a time in a particular village, explaining matters to the people and endeavouring to get them on to his side. The Range Officers are therefore expected to spend at least 20 days in each month away from headquarters.

9. *Forest journals.*

45. (i) The journal should be kept by the Range Officer in the forest note book.

(ii) There should be a separate book for each forest block or series and one for unorganized forest. In the case of fuel and casuarina forests one leaf for each coupe will suffice. The pages in each book should be numbered and an index given on the first page.

(iii) The entries in the journal should be limited to the record of observation actually made in the field, and should be made by the Range Officer himself in English. The notes to be made should refer to—

A.—Growing Stock.

(i) General.

(ii) Natural reproduction.

- (iii) Bamboo flowering.
- (iv) Seed years of important species.
- (v) Seasons of flowering, ripening of seed, leaf fall and new leaf.
- (vi) Species whether or not killed by girdling.
- (vii) Coppicing capacity of important species.

B.—Factors influencing the crop.

- (i) Man : forest offences.
- (ii) Fire protection.
- (iii) Climate.
- (iv) Injurious plants, such as Lantana, Eupadarium odoratum, Strobilanthes, and any other species which may become dangerous.
- (v) Other causes of injury.

C.—Results of work done.

- (i) Marking for regeneration fellings and the result of the operations.
 - (ii) Marking for fellings other than for regeneration. These will include fellings made for improvement of the forest as well as those for yield purposes.
 - (iii) Creeper cutting.
 - (iv) Felling ficus-bound trees.
 - (v) Stream improvement.
 - (vi) Notes on extraction.
 - (vii) Brief references to roads, bridges, paths, buildings, camping grounds, fences and wells.
- (iv) The notes should be terse and not be in too large writing as the journals are permanent and room must be left for entries in the future. They should not exceed 2 or 3 lines under each head.

(v) In the case of the book for organized forest the heading of the column 'Range' should be changed to 'Block' or 'series' (in the case of unorganized forest to 'village') and that of the column 'forest' to 'compartment' or 'coupe'.

CHAPTER II.

MANAGEMENT OF FORESTS.

1. *Boundaries and boundary marks.*

46. The following rules must be observed regarding erection of boundary marks and their upkeep :—

(i) A special forest boundary-mark is to be erected at every survey mark.

(ii) If the survey boundary-marks are so far apart that the special forest boundary-mark at them cannot be seen owing to the distance, or the physical configuration of the ground, then intermediate special forest boundary-marks must be erected between the two points so as to make the line clearly visible.

(iii) To avoid erecting more special forest boundary-marks than are absolutely necessary, and also to define the true line of the boundary clearly, all bushes and under-growth between two boundary marks should first be removed.

(iv) This clearing should consist of cutting down only all the undergrowth that impedes the view, preventing one forest boundary-mark being seen from its neighbouring one, or when crossing the boundary line at any point, two boundary marks, one on the right hand and the other on the left should be visible.

(v) The breadth in clearance should, in no case, exceed 6 feet or 2 paces, unless the line constitutes a fire-line.

(vi) Nothing is to be cut growing outside the true forest boundary-line.

(vii) Trees on the boundary should not be cut down so long as they do not obscure the view of the boundary-marks one from the other, unless for clearing a fire-line.

(viii) Where there is but little to cut, the Beat Officer can clear the boundary-line with his own hand.

(ix) But where the undergrowth is heavy and the material is saleable the work may be undertaken at Government cost, funds being provided for it in the Budget.

(x) Where the undergrowth is heavy and there is no sale for it, Range Officers should, if possible, arrange to have it cut by the villagers, giving them in remuneration the material cut. But in each such case the sanction of the Divisional Officer must always be obtained previously.

(xi) The Beat Officer must, after the boundary has once been cleared, keep down all regrowth.

Specification of forest boundary marks.

47. (1) In hilly country and also in the plains where stones are not to be found in considerable quantity there shall be two classes of forest boundary marks of the following specification :—

First Class.

Shape—A truncated cone.

Description.—Built of loose stones upon an excavated foundation so that the lowest tier of stones shall be held in position and not pushed out by the weight of the superstructure.

The interstices between the large stones composing the cairn are to be filled in with small stones and the outer stones are to be wedged with stone chips. A shaped stone showing a height of at least 15 inches is to be fixed firmly on the top of the cairn in the centre.

Foundation.—Six (6) inches to be dug out.

Dimensions.—First class marks to have a base of 7 feet diameter, to be 5 feet high and the top to be 4 feet diameter.

Second Class.

Second class mark to be on a base of 4 feet diameter, to be $3\frac{1}{2}$ feet high and to be $2\frac{1}{2}$ feet in diameter on top.

Indicator.—A cut stone showing at least 15 inches clear of the cairn to be embedded firmly in the centre on top; the stone to be large enough for a serial number to be cut on it if required.

Colour-wash.—The stone to be colour-washed red annually and lines of the same colour are to appear on the

top of the cairns radiating from the centre stone to show the direction of the boundary-lines.

Position.—A first class boundary mark to occupy main points and angles, such as where the boundary of a forest block, forest compartment or village may intersect the forest boundary, and where the latter may take an abrupt turn.

A second class boundary-mark to occupy intermediate points.

Where loose stones are not plentiful, instead of small cairns to occupy intermediate stations, the first class marks can be connected by a row of stones, showing one foot above ground placed in a single line, one guntha chain or 22 yards apart which are to be coloured red.

Approximate cost.—A first class boundary-mark can be constructed at an expenditure of from 7 to 9 annas and a second class boundary-mark at a cost of from $2\frac{1}{2}$ to 4 annas.

(2) In the plains where loose stones are not plentiful, the forest boundary-mark may consist of either—

(a) a truncated cone made of earth well rammed, or of sun-dried bricks, or it may consist of the ordinary revenue survey band or boundary-mark with a stone stuck on the top which will be coloured red and the bands upon the forest boundary will be connected by stones showing one foot above ground, to be colour-washed red; or

(b) a cut stone 2 feet above and $1\frac{1}{2}$ feet below the ground, 9 inches in width and 6 inches in thickness, with letters R.F. $2\frac{1}{2}$ " to 3" in height inscribed on the side facing outside the forest.

It is desirable that the reserves on the plains shall be fenced, and the fences will be supplemental to the boundary-marks for defining and protecting the forest boundaries. Living fences may be made of *Euphorbia verrifolia* (sabri) and *E. Tirucalli* (sher), *Inga dulcis* (Vilayati Chinch or Deckni Babool), *Lawsonia alba* (Mendhi), etc.

(3) If for want of labour and other causes difficulties occur in erecting cairns as boundary marks on the outer boundary of any forest, it will be sufficient to fix diamond shaped iron plates 10" × 10" to trees on the boundary at all bands and at a maximum distance of 50 yards between bands.

The plates should be coloured red for closed and white for open forests.

48. The rules given below regarding inspection and maintenance of forest boundary marks must be attended to :—

(i) The Beat Officer will be responsible for the maintenance and protection of all the boundary marks in the forests of his beat, he will colour-wash them annually after the Divali holidays and will make a special report of having performed this work, he will repair with his own hands any marks that may become disarranged.

Each forest boundary mark in his 'beat' is to be specially inspected by the Beat Officer at least once in every three months, and a record of his inspection of marks is to be entered in his diary when it may occur.

(ii) The Round Officer will be responsible for the maintenance and protection of the boundary marks in the forests of his round, he will see that they are maintained in proper repair, are colour-washed, as directed, by the Beat Officer, and that the required measure of planting upon the forest boundaries is undertaken and performed by the Beat Officer.

The Round Officer will specially inspect every forest boundary mark in the forests of his round once in every year and will make a record of every inspection made in his diary when it may occur, and also will submit a special report to the Divisional Officer upon the state and condition of the boundary marks, forest boundaries, living hedge, etc., as soon as he may have completed the inspection of the boundaries of any forest village or forest block.

(iii) The Range Officer will, during the official year, inspect and specially report upon the state and condition of the forest boundaries and forest boundary marks of not less than two miles of forest boundary in every 'beat' in his range. A record of inspection made will be entered in his diary when they may occur.

2. *Communications and Buildings.*

(a) *Roads.*

49. The Range Officer should see that all roads that are used or likely to be used by the Forest Department are

kept in proper repair. His attention is called to the following points in carrying out these:—

(i) mile posts should be renewed and repainted when necessary ;

(ii) all obstructions should be cleared, including overhead and side cover likely to hinder traffic ;

(iii) drainage systems should be improved and renewed ; to effect this satisfactorily occasion must be taken during early rains to inspect roads during a heavy down-pour ;

(iv) ruts and hollows must be filled in with suitable material ;

(v) bridges and culverts must be examined at the beginning and end of the rains to see if they are safe and any defects put right. The timber of permanent bridges will be given a coating of coaltar in the hot weather, once in two years ;

(vi) where a bridge will not bear heavy traffic or elephants, the stream bank just below should be cut away where necessary to provide an easy crossing.

50. Dragging timber along the Forest Department roads is not allowed ; all cases of this being done by villagers or contractors should be reported by Beat Officers.

51. Range Officers should submit an estimate every September for annual repairs to all Forest Department roads and bridle paths in the prescribed form. Appendix A.

52. Special orders will be issued by the Forest Engineer with respect to new road construction. Estimates for new roads will be submitted in the prescribed form. Appendix B.

(b) Buildings.

SELECTION OF SITES FOR SUBORDINATES' HOUSES.

53. Sites for Rangers, Foresters, Guards and Naka houses should be such that the subordinates with their families can live in those particular houses and for this reason such sites must not be chosen in isolated positions in the forests but should be either built near to other forest or Government

buildings such as those of the Police, Public Works, and Customs Departments, or near habitations such as villages. The ground on which they are built must belong to the Forest Department or be Government waste obtainable without cost and, finally, there must be a good water supply close at hand. Without these essentials the cost of building will be wasted money as no official will occupy an isolated house in a wild jungle where there is no potable water.

54. All buildings must be inspected as frequently as possible. Estimates for annual repairs should be submitted in September, but when repairs are urgent Range Officers may send in supplementary estimates at any time. The following points must be carefully attended to:—

(i) Leaks in roofs must be immediately made water tight.

(ii) All posts should be tarred once every five years 2 feet above the ground level.

(iii) Drains of roof drip should be put in order at the beginning of the rains.

(iv) Fences should be kept in repairs and no cattle allowed into the compound.

(v) Wells should be baled out at the end of the rains.

(vi) All subordinates are to reside permanently in the houses built for them by Government and in no others, but they are not to damage or make any additions to the same.

55. The compounds of all subordinates' quarters should be cleared of all rank growth and grass by the officials residing therein at their own expense or by their own labour. Rest house and depot compounds are to be cleared at Government expense. For any damage which accrues from fires in the compounds, the Range Officer and the local subordinates are responsible.

56. (i) Subordinates are forbidden from erecting thatched huts close to their quarters or adding such temporary constructions to the buildings for the purpose of a cattle shed, storing grass and fuel or bathing. Such constructions

are not allowed within 50 feet of any Government building under any circumstances.

(ii) Similarly the using by subordinates of the verandahs or portions of Government buildings for tethering cattle, storing grass and fuel or bathing is forbidden. The occupants will be held responsible for seeing that the buildings and their surroundings are always kept clean.

57. Beat Officers will be jointly responsible with the peons in charge that—

(i) Rest houses are clean and as far as possible free from vermin, white ants, wasps, nests, etc.

(ii) The furniture is kept clean and free of dust.

A framed copy of the rules for the occupation of forest rest houses will be hung on the wall together with a list of furniture and crockery with the value noted against each. These rules should be carefully explained to the peon who will be responsible for promptly reporting all breakages.

ACCOUNT OF TIMBER, ETC., USED FOR GOVERNMENT WORKS.

58. A proper account should be kept of timber, etc., used for departmental buildings, bridges and other works. To obviate any misuse of such material the following procedure is prescribed :—

(i) In each case the Range Officer should submit to the Divisional Officer an estimate of the forest produce required, stating the forest from which he can conveniently bring it.

(ii) On receipt of the Divisional Officer's sanction, the Range Officer should make out a permit, mark the trees himself and have them felled and removed under the supervision of the Round Officer or any other subordinate specially deputed on the work within the time specified in the permit.

(iii) Before removal from forests the Range Officer should revisit the cutting work, see whether the stumps have been properly trimmed, stamp them with the S stamp, measure the logs and rafters himself and hand

them over to the official in charge of the work, taking his receipt for the same.

(iv) The official in charge of works should keep a regular account in the form given in Appendix C, which will be supplied by the Divisional Officer under his seal and signature, of all the material given in his charge.

CHAPTER III.

IMPROVEMENT OF FORESTS.

The following rules are of general application but are not to supplant the directions given in sanctioned Working Plans.

1. *Improvement fellings.*

59. These are made in the interests of valuable species only.

The trees to be removed by these fellings will consist of unsound and ill-shapen trees of any size and species and of all trees of inferior species interfering or likely to interfere with good growth of the more valuable species, mature trees over advance growth provided, always, that young growth shall never be uncovered to such an extent as to cause danger of injury from drought, that a sufficient number of seed-bearers suitably distributed shall be maintained, that the ground shall never be over exposed, nor the density of the crop unprofitably reduced. As a general rule no tree will be removed unless there is a better one to take its place.

60. (i) The fellings will be divided into two classes, viz., O and Y improvement fellings.

(a) 'O' fellings to assist larger trees which have got above the bamboos. These are only done at considerable intervals.

(b) 'Y' fellings to assist young growth and increase the number of seedlings. These are repeated at short intervals until the young growth can be left to look after itself.

(ii) 'O' improvement fellings will be made in the interests of trees that have passed out of the pole stage. As a rule nothing should be done to assist trees that exceed a growth of 6 feet in the moist and 4 feet in dry forests. 'O'

fellings are of the nature of a thinning in a mixed crop, should follow extraction as soon as possible and should be repeated at intervals of 15 years. The objects of 'O' fellings are—

(a) to ensure that the final crop shall consist of sound well-shaped trees of the more valuable species and that such final crop shall attain its marketable dimensions in the least possible time ;

(b) to save well-shaped trees of valuable species, that are likely to constitute the final crop, from periods of suppression or semi-suppression.

(iii) 'Y' improvement fellings are made with the primary object of establishing such natural regeneration of teak and other valuable species as may be found on the ground. They will be repeated as often as may be found necessary until their object has been achieved and the resulting saplings and poles are out of danger of suppression by bamboos or faster-growing species.

(a) Large teak trees will not receive any attention, but large trees of other species with low spreading crowns which are interfering with young teak advance growth should be felled.

(b) This type of improvement fellings, having to be repeated several times, will be costly and must therefore be confined to those portions of really valuable forests in which the advance growth justifies it and whence extraction will be easy.

(c) Whenever possible 'Y' fellings should follow the extraction of the trees girdled under the provisions of a working plan or girdling scheme and suitable localities should be noted by the girdling officer. Where this is not possible 'Y' fellings, if made, should be carried out in areas which will not be girdled over for at least 12 years.

(d) Portions of the areas selected for 'Y' fellings will often contain no teak although the soil and general conditions are eminently suited for its growth. Teak should be brought on to such areas by the *Taungya* method while the 'Y' fellings are being made over those portions of the area in which natural regeneration of teak exists.

61. The following rules must be observed in the case of all improvement fellings :—

(i) Good trees of marketable species, overshadowing trees of valuable species, should only be killed if the

dominated trees are likely to increase in value more than the suppressing trees, or if the dominated trees are required for sylvicultural reasons (*e.g.*, for the production of seed).

(ii) Seedlings of valuable species should be assisted by freeing them from bamboos and under-growth. Superfluous shoots should be removed. All trees with low spreading crowns should be felled, if interfering with seedlings of valuable species.

(iii) The crowns of healthy, well grown and promising young poles and saplings of the valuable species should be free from overhead cover either by felling trees or by lopping branches. Large gaps are not to be made to free isolated seedlings.

(iv) Whenever the removal of bamboos is desirable, not only should the immediately dominating culms be cut, but also those that are likely to dominate the valuable species in the near future. If it is necessary to cut any bamboos usually the whole clump must be cut over.

(v) Trees of inferior species and unsound trees of valuable species should (except as hereinafter provided) be girdled, if girdling will kill them or if felling them would damage teak or other valuable species.

(vi) Fellings should be carried out before the principal species lose their leaves.

(vii) Trees likely to fall across a road or a floating stream should be felled; and if saleable, properly logged.

(viii) Small trees should be felled and not girdled.

(ix) Small trees and bamboos should, as far as possible, be felled away from the valuable trees to minimise the risk of damage from fire, and no felling debris should be left within 3 feet of the base of any valuable tree.

(x) Care should be taken to avoid excessive interruption of the leaf canopy as experience has shown that the ground in moist forests when fully exposed to light is immediately occupied by a dense growth of creepers

and weeds, through which seedlings and saplings of the more valuable species cannot make their way.

(xi) Climbers, including young ficus or other epiphytes, should be cut, either before, or in conjunction with girdling and improvement fellings.

(xii) Stems of valuable species up to about 18 inches girth that are broken or damaged in felling or extraction, as well as crooked, bent, forked or unsound saplings and poles of the valuable species which are capable of producing good coppice shoots, should, when such reproduction is required, be cut back flush with the ground and light let in.

(xiii) Trees of all species which are badly enveloped by ficus should be felled. Trees slightly attacked, or those on which harmless epiphytes are growing, should not be killed unless for sylvicultural reasons.

(xiv) In clearing for groups of young teak, bamboos and climbers must be cut first; then larger trees must be felled and finally teak must be coppiced where necessary.

(xv) When two or more small teak are found growing from the same roots, the best and straight must be left and all others cut out.

(xvi) As a rule 'O' and 'Y' improvement fellings will be made in separate compartments. Where this is not considered advisable both types of fellings are made in the same compartment, the localities operated upon should be separately shown on the 4 inch map and the cost of each operation calculated separately. If this is not possible the expenditure on each operation should be apportioned by estimate as accurately as possible.

62. The reasons which necessitate improvement fellings are generally—insufficient protection, excessive or unregulated working, unrestricted grazing and destructive fires in the past.

63. The following rules must be observed when marking the trees for felling:—

(i) No tree should be marked the removal of which would cause a blank, or increase an existing blank.

(ii) No good seed-bearers should be marked.

2. *Supplementary operations.*

64. These operations comprise—

- (a) weeding ;
- (b) cleaning ;
- (c) cutting back injured trees ;
- (d) filling up blanks ;
- (e) climber cutting ;
- (f) thinning ;
- (g) girdling.

65. *Weeding* is an operation by which noxious weeds and any objectionable plants, which check and oppress the growth of the young seedlings in plantations and sown areas and in naturally formed seedling crops are removed. In a well established thicket of seedlings, if the young plants completely cover the ground, they leave no room for weeds and undesirable forms of vegetation.

66. The following rules must be observed when weeding :—

(1) Weeding consists of uprooting grass and cutting back growth interfering with or likely to interfere with young teak or other valuable species.

(2) It may be necessary to weed for two or three consecutive years after the formation of a plantation, or natural regeneration area.

(3) It is always done in the rains. In the first year after formation, it is necessary to weed areas at least twice, once soon after the rains break and again in September or October.

(4) In early weeding it is advisable to uproot the weeds round the seedlings but later, when plants are bigger, only weeds which are suppressing or likely to suppress the plants need be cut back.

(5) In plantations the whole area should be thoroughly gone over, every line being completely opened out for a distance of three feet on each side and

the cut material piled in heaps between the lines. If two or more plants are found at one place the best of them should be left, the remainder being cut back. Crooked or damaged seedlings should be coppiced.

(6) In weeding in natural regeneration areas the work is more difficult. Seedlings of all valuable species have to be carefully searched for and on no account are coolies to cut about in an aimless manner. The first weeding should be thoroughly done as seedlings are often hard to find.

67. *Cleaning*.—This operation consists in removing inferior species and branches of trees and bamboos covering overhead the young growth and impeding their growth, in order to give them sufficient light from above.

68. The following rules must be observed in cleanings:—

(1) Useless species including bamboos interfering or likely to interfere with the principal species must be felled. The felled material must be cleared away from the young plants.

(2) Damaged or badly shaped trees of the principal species must be cut back.

(3) In High Forests if two or more shoots of the principal species spring from the same root the best must be left and the others cut back.

(4) All climbers must be cut.

69. *Cutting back injured trees*.—Old trees which have been injured in the principal and improvement fellings in such a manner as to render them unfit for the production of timber and young crooked teak should be cut back flush with the ground in order that they may be replaced by straight and vigorous shoots springing from the stool. No stem of any undesirable species would be cut back but only those of value; nor would it avail to cut back any broken or ill grown saplings situated under the thick shade of neighbouring trees, because, without direct light, the stool will be unable to throw out a vigorous new shoot. These operations are most usefully made immediately after a felling, so that all the young stems in the coupe which have been damaged or broken in

felling and export, as well as any badly grown saplings, may be replaced by better stems springing from the young stool.

70. *Filling up blanks.*—In places where the more valuable species are wanting, or occur in small numbers, they should be artificially produced if practicable.

Note.—The flowering of the Karvi every eight years should be noted and provision made for cutting it back when in flower to prevent its seeding. Shoots springing up after the cutting must be cut back. Seeds of valuable species can then be dibbled in.

71. *Climber cutting.*—This operation should be done more carefully immediately after the coupe is cleared than before the improvement felling. Climbers of all kinds and of all sizes should be destroyed so as to prevent their damaging the young growing stock. The operation should be repeated whenever it is found that the climbers are doing damage.

72. All subordinates should take every opportunity to cut climbers when met with. If the Divisional Officer observes climbers uncut he will have reason to consider there is serious slackness in the range.

Thinning—Object of thinning.

73. (i) The object of thinning a forest is to provide for each tree left standing that growing space which is best suited to its further development and to keep the leaf canopy complete.

(ii) Where the growing stock is too thick, it should be thinned, so as to provide sufficient growing space for the saplings which are left. The inferior kinds should be first removed and, if the canopy is too dense, the worst of the better species may also be removed.

(iii) Thinnings are made in the principal crop with the object of giving enough room for the development of the best stems.

Advantages of thinning.

74. (1) The growth and proper development of the more valuable species are favoured.

(2) The required character of the forest is preserved in mixed woods.

(3) The danger from fire, insects and fungi is greatly reduced by the removal of dead and diseased trees.

(4) An early money return is obtained.

Consequences of severe thinning.

75. (1) Increase in volume in each tree is greater but the annual yield is reduced.

(2) Height growth is less.

(3) Stems are conical and yield much less timber.

(4) Timber is less valuable owing to numerous and large branches.

(5) Leaf canopy is open and consequently the soil becomes poor.

Consequences of not thinning.

76. (1) The growing space available for each tree is insufficient.

(2) The leaf and root systems are not fully developed.

(3) The trees appear sickly and liable to be attacked by insects and fungi.

(4) The trees grow tall and thin.

(5) The annual increase in volume per tree is less.

Principles of thinnings.

77. The dead and suppressed trees are first removed (*i. e.*, light thinning) if the stock is still too dense, some of the dominated trees should be removed (*i. e.*, moderate thinning) and, if even this is not enough, then all the dominated and even some of the dominant trees should be removed (*i. e.*, heavy thinning). In any case the leaf canopy should be kept as complete as possible.

78. A thinning is a very important operation and should only be carried out by trained subordinates.

79. The following simple rules should be observed in carrying out thinnings:—

(i) Suppressed stems need not necessarily be cut out unless they interfere with the good stems left. They may however be felled if they can be sold at a profit, provided the soil is not exposed by felling them.

(ii) Dominant stems which are unlikely to improve owing to their being crooked, forked or unsound should be cut out in the interest of any suppressed stems that are likely to improve.

(iii) When two or more dominant stems are interfering with each other and preventing proper development of the crown, the work should be to free the crown of the best one and cut out the others.

80. *Girdling*.—The auxiliary and inferior species which are interfering or likely to interfere with the more valuable ones and which have not been removed in the improvement fellings owing to the protection they afforded, should now be girdled (provided girdling will kill them) if there is no sale for the wood. If felling is necessary this is best done one or two feet from the ground. The best time for girdling operations is the commencement of the growing season, because, the cambium layer is then very active and the whole of the tissues outside this can be removed in one piece.

Note.—The chief rules to be observed in the selection of trees or saplings for girdling or cutting back are :—

(i) The cultural operation should begin after the coupe has been worked out ;

(ii) All unpromising seedlings and saplings of the principal species should be carefully cut back ;

(iii) Saplings of inferior species above 6" in diameter should be girdled or cut down above 2 feet above the ground ;

(iv) All climbers should be cut if they are not small enough to be pulled up ;

(v) All worthless trees interfering with the growth should be girdled to death or felled and obstructing bamboos and branches of trees cut back.

CHAPTER IV.

SYLVICULTURE.

(a) *Natural reproduction.*

1. *Reproduction by Seed.*

81. Forest trees usually begin to bear fruit shortly before the time at which their principal height growth is completed. It is about this time that they produce fertile seed abundantly and regularly.

82. Teak coppice will often produce seed when the shoots are quite young and productive seed may be obtained from 5 year old shoots in some localities but most teak coppice begins to yield good seed from the tenth to fifteenth year.

83. A sufficient degree of light is necessary to enable a tree to bear fruit ; that growing in an isolated position, with a large spreading crown, will be in a position to produce better fruit than a tree placed in a closed crop with a small contracted crown.

84. The size of the seeds and the method by which they are transported from place to place are factors affecting the distribution of species and the natural composition of forest crops.

85. The seeds of some species, such as teak, the different kinds of *Terminalia* and *Zizyphus*, will not ordinarily be transported to a great distance, but will germinate either directly underneath the crown or within a few yards of the parent tree ; whereas light or edible seeds which are carried by the wind or by birds, like those of *Bombax* and the figs, may be found anywhere.

2. Reproduction by stool-shoots or root-shoots.

86. *Stool-shoots* are of two kinds and derive their origin either from *dormant buds* which are already existing in a rudimentary state under the bark of the tree or else from *adventitious buds* which appear in the new tissues that grow over a wound or a section of the parent stem. The former are the stronger and generally the more numerous, and such shoots are more intimately connected with the parent stool than the latter which are easily broken off from it. Stool-shoots appear close to the surface of the ground and their young tissues usually throw out independent roots so that in time they may detach themselves from the trunk leaving the latter to decay sooner or later.

87. The nourishment and growth of these shoots, which more readily spring from places where the bark is thin, depend entirely at first on the root activity of the parent stool and form an independent stem and on the amount of nutritive material stored up in its tissues. Direct light is always necessary for their development.

88. *Root-shoots* often spring from adventitious buds or healthy or uninjured roots of trees and require free aeration for formation. They soon throw out independent roots and, although they have not the same longevity as a tree sprung from a seed, offer a superior means of reproduction and growth than the stool-shoot. Chandan (*S. album*), Sissum (*D. latifolia*), Kosimb (*S. trijuga*), Tiwas (*O. dalbergioides*) are instances of common trees which reproduce themselves freely by means of root-shoots.

(b) *Artificial Reproduction.*

1. *Sowing.*

89. *Choice of species.*—The species to be sown should generally be one of the principal trees of the locality and should in any case be one entirely suited to the local conditions of soil and climate.

90. *Quality of seed.*—(i) The first essential to success in sowing is the use of sound, healthy seed of good quality. The seed, to begin with, must be perfectly ripe and then, as a rule, the sooner it is sown the better.

(ii) The seeds of some common trees begin to germinate immediately on falling and must be sown at once; of some species the seeds lose their germinating power within a few weeks, while others retain it for several months or for years. A thin soft shell, or the presence of much oil in a seed, usually results in its soon losing its germinating power early. Some seeds, such as teak, remain good for two or more years, if not exposed to much moisture. Teak seed will often germinate better if kept a year.

91. *Collection of seed.*—(i) Seeds should be collected from (1) healthy and vigorous trees over 4 feet and 6 inches in girth, fully fertilised; (2) middle aged trees having well developed crowns; (3) trees standing not too close; (4) trees on favourable soil and situation; (5) fully ripe fruits.

(ii) The seed borne by healthy trees, and growing in the same kind of locality as that in which sowing is to be made, will generally yield the best results.

92. *Testing of seeds.*—The seed, if good, should completely fill the shell and should have a good colour.

healthy smell and a sufficient degree of moisture. In the case of heavy seeds, the quality may also be judged by putting them in water, when the sound ones will usually sink and the unsound will float. For the same species heavy seeds are preferred.

93. Conditions of germination.—(i) The conditions for the successful germination of seeds are :—

- (a) a constant but moderate supply of moisture ;
- (b) an even and fairly warm temperature ;
- (c) free access of air.

These conditions are secured by the preparation given to the ground before sowing, by the manner of covering the seed when sown and by sowing at a suitable season of the year.

(ii) A suitable germinating bed is secured by first removing any obstructive surface covering such as shrubs, weeds, grass, or accumulation of undecomposed humus, and then by loosening the soil. By this means, air, heat and moisture are admitted into the soil in which roots are enabled to spread readily and penetrate deeply while the mingling of the different layers of the soil renders it more active in nourishing the young plants. A clean, loose, moist, warm bed is all that is necessary ; and manuring is seldom required.

(iii) The object of covering the seed sown is to protect it against sudden changes of temperature and moisture, and to prevent it from being eaten by birds or animals, or from being carried away by wind or water. The covering of earth should be just thick enough to afford the necessary degree of protection without being so thick as to exclude the air, or make it difficult for the young seedling to push its way up to the surface.

(iv) With regard to the best season of the year for sowing, it is obvious that artificial sowing should be done at the time of the year at which the degree of warmth and moisture necessary for the germination of the seed is most readily available. In this part of the country the best time is at the beginning of the summer rains, because at this time there is a certain and sufficient supply of moisture and heat and the seedlings get several months in which to establish,

themselves in the ground before the next dry season comes round.

94. *Broadcast sowing.*—In broadcast sowing the seed is scattered, usually by hand, over an area previously prepared by burning. In this method the result is never likely to be regular, as the young crop of seedlings is almost sure to grow up densely in some parts, and too thinly in others.

95. *Dibbling.*—(i) By dibbling is meant a method of sowing which consists in placing two or more seeds in small holes picked by a pointed stake or bamboo in the soil which is left without other preparation. It is a cheap and easy method of sowing large seeds in localities not subject to a heavy growth of weeds, the holes are pricked at a suitable distance apart to a depth of about 2 inches in lines and lightly closed after two seeds have been dropped into each.

(ii) Dibbling should be completed by the 15th April. The spacing should be 6' × 6' unless otherwise ordered. No planting should be done within 20 feet of a road or path. Dibbling on prepared patches over areas just burnt often gives good results.

2. Nurseries.

96. *Permanent and temporary nurseries.*—Nurseries may be either permanent or temporary. A permanent nursery is worked continuously for the supply of plants required year after year for extensive planting operations, while a temporary nursery is one that is only maintained for a year or two to furnish the plants locally required for filling up blanks in the forests. The former, therefore, is larger, more elaborate, and better equipped than the latter, and its initial cost is much greater. Temporary nurseries are most commonly employed for forest work, because they require less outlay of money for their formation, and because it is of great advantage, both financially and culturally, to have the young plants grown close to the spot where they will be required, so that they only have to be transplanted a very short distance, and because it is preferable that the seedlings should be reared in conditions similar to those in which they are expected subsequently to live.

97. *Choice of site.*—In choosing a site for nursery it is in the first place desirable to select a place as centrally situated as possible, easily accessible and with a convenient water-supply. The site chosen must be sheltered from the chief external causes of injury, such as wind, drought, etc., and no tree should as a rule be retained within the area, though a belt of trees at a slight distance is generally desirable in order to give lateral shelter, and to mitigate the force of the more violent winds without interfering with the free access of light and air. Blanks and old clearings will thus often afford good sites. A gentle slope is desirable in order to ensure a sufficient degree of drainage. Lastly the soil should be of good medium quality and fertile enough to produce strong, vigorous plants. The best soil, therefore, will be a moist, sandy loam. A clay soil is, in most cases, quite unsuitable for nursery work. Good depth of soil, not less than 3 feet, is essential, so as to ensure an even degree of moisture. Loose stones, if present in the soil, should be removed.

98. *Area required.*—The area of the nursery depends on the number, species, age and size of transplants that are to be put out, as also on the number of times that they are to be planted out (in the case of a permanent nursery).

99. Permanent nurseries may often extend to 4 or 5 acres. The shape should be as regular and compact as possible either square or rectangular, so that there will then be no unnecessary waste of space, while the cost of fencing will be minimised.

100. *Fencing.*—Some kind of fencing is always necessary to protect forest nurseries against animals. A permanent nursery fence may consist of a stout wooden, bamboo, or wire fence; temporary nurseries may often be fenced with hedges of thorny shrubs, or bamboos, etc.

101. *Watering.*—Watering seedlings in the nursery should as far as possible be avoided. In the case of teak watering often produces soft pithy stemmed plants which wither or rot when transplanted in the forest and better results are generally obtained by limiting the watering to occasional wetting of the seed bed to force germination and when once the seedlings appear, shading by mandwas and a layer of an inch or so of fine earth spread over the nursery, is all that is required.

The nursery must of course be weeded by uprooting grass and herbs as they appear.

102. *Laying out the nursery.*—Select a well drained area with good soil, then clear the ground of all stones, trees, shrubs, weeds and grass. The area should then be ploughed or hoed to a depth of 2 feet in order to render it loose and soft and clear from all traces of roots, underground stems, weeds and grass. Care must be taken not to bury the upper layers of the soil, which, being richest in vegetable mould and other matter, are required to form the seed bed. When the ground has thus been suitably prepared it only remains to lay out the beds.

103. In nurseries, foot-paths of a foot or two in width, in suitable places, may be sufficient. The beds should be laid out in parallel lines, should be rectangular in shape and about a yard in width so that the workmen can readily reach across them. The beds should be laid out in terraces.

104. *Sowing the seed beds.*—(i) The nursery beds may be sown either broadcast or in line or drills.

(ii) In broadcast sowings the seed should be scattered as evenly as possible over the surface of the entire bed and, in the case of seeds which germinate slowly or badly, should be sown very thick. Small, light seeds may be conveniently mixed with some fine earth or mould before being scattered on the bed.

(iii) The seeds should be covered by sprinkling some fine rich earth. This method is not very well suited for most large seeds, as it is difficult to ensure their being covered to a uniform depth.

(iv) The object of sowing in lines is to economise space and to procure regular rows of seedlings in which each plant has room for expansion on two sides, and can easily be removed for transplanting. This arrangement also facilitates weeding and tending. The lines of seeds in a bed will usually be about 6 inches apart, according to the size of the plants, their rate of growth, and the age at which they are to be removed.

(v) Within the drills the seeds may be sown either continuously or at intervals of a few inches, to suit the same

conditions. The drills consist of small, shallow furrows, the width and depth of which will depend on the size of the seed which they are to contain. They may easily be made with a piece of a wooden batten or bamboo. The seed is then sown in these drills by hand and covered up with a light sprinkling of rich earth; the beds should then be watered and kept moist until the germination of the seed is complete.

105. *Transplanting*.—(i) Planting may be done in the forest either by taking seedlings directly from the nursery beds in which they have been sown or else by putting out transplants which have been moved once in the nursery lines. In the latter case the seedling plants must be spaced in the nursery bed so as to leave room for proper development, but seedlings which are to be pricked out in the nursery may be grown close together in the seed bed. Seedling plants are cheaper than transplants though generally only suitable in the case of hardy species in favourable localities. Transplants, on the other hand, though more costly and requiring more time, labour and space for their production, are stronger and better developed, having a full and compact root system. In nursery work it might sometimes be advantageous to classify the seedling plants, when sufficiently old, by putting the most vigorous ones direct into the forest and keeping the best of the more backward ones in the nursery lines, where they will remain until sufficiently developed. Weakly and badly shaped plants should be thrown away. One of the principal objects of successive pricking out in the nursery lines is to prevent the formation of a long tap root, and to encourage instead the growth of a thick mass of short bushy roots which will permit the removal of a plant of sufficient height, with a block of unbroken earth around its roots into the forest, without much difficulty or danger.

(ii) Transplants are generally grown in rows or beds called nursery-lines, in the nursery, the soil of which is prepared in the same way, and with nearly as much care as that of the seed bed already described. The labour and expense of nursery lines is always considerable, and they should only be resorted to when the locality is to

be restocked, or the conditions of growth there are so unfavourable that seedlings taken direct from the seed beds would have little or no chance of succeeding. Seedlings should be pricked out generally when quite young.

(iii) The best season of the year for transplanting is at the beginning of the rainy season.

(iv) The lifting of the seedlings from the seed bed should be done as cheaply as is compatible with the safety and future welfare of the plants. Thus, while plants of some kind can tolerate rough handling and recover readily from extensive injuries, others will require great care. Plants lifted with their roots embedded in a ball of earth suffer least. Some plants raised from seed sown broadcast may be lifted with a trowel or a thin piece of split bamboo and larger plants may be raised by means of a circular spade which lifts a cylindrical ball of earth, 3 or 4 inches in diameter enclosing the plant.

(v) Each seedling, with the ball of earth round the roots, is placed in a hole of sufficient depth and earth placed lightly round it. Larger plants are similarly planted in a small trench or pit with a depth equal to at least the length of the root of the plants, and with one side nearly vertical.

106. *Tending of nurseries.*—Seed-beds and nursery-lines often need to be protected against heat and drought by means of thatch or mats placed over the plants during the afternoon. Insects that attack the leaves and buds of the seedlings must be picked off and killed, or the whole bed may be sprinkled with lime ashes or asafoetida.

3. Planting out in the forest.

107. *Conditions of success.*—They are:—

(i) The species selected for planting must be one that will suit the object of management in the forest, whether that object be the supply of produce of a definite description, or the protection and improvement of the soil, or any other.

(ii) It is necessary to employ healthy, vigorous plants, which are straight and well proportioned, possessing a well developed root system and a healthy

crown. The plants must be of such a quality that they can bear well the interruption of growth involved in their being transported from one locality to another.

(iii) The early part of the rainy season is the best for operations of this sort, for at that time the air and soil are moist and warm, and there are several months of moist, warm weather to follow.

(iv) The most advantageous distances at which to place the plants will be from 6 to 9 feet apart.

(v) The drying up of the rootlets has to be guarded against and the shorter the time the roots are left uncovered the better they will keep. Those plants which are removed with their roots embedded in a ball of earth suffer least, and, while being transported, should be packed in baskets or cases. Such baskets are generally made of broad leaves or loosely woven bamboo splittings and are placed in a little hole made for the purpose in the ground together with the plant. The cost of baskets is small and they should be allowed to rot in the earth. Basket planting is considered the safest of all methods of planting.

(vi) It is essential that all fires, grazing and traffic should be prevented.

108. *Cultivation of natural teak seedlings.*—(i) For a space of $1\frac{1}{2}$ ' round each seedling the ground should be weeded and a little loose earth spread but care must be taken not to place earth against the stem of the seedling.

(ii) The weeding should be continued throughout the rains and the weeds left lying within the 3' circle and, at the end of rains in October, loose earth should again be spread round the plant, burying the dead weeds.

(iii) Surface soil-mulch is any material spread upon the soil to shade the surface from the sun, to break the connection between the water-bearing subsoil and the exposed surface.

(iv) Timely tillage is necessary to prevent the formation of a soil crust which would permit moisture to evaporate.

(v) Should there be any shower in the hot weather, the broken soil and mulch round the plant not only soak up every drop that falls round the plant but also take up much

that flows down the hill side. The soil surface of most hills in this country is a hard close crust from which all the rain water of the hot weather showers runs off.

(vi) Again, the surface soil-mulch blinds the soil and smothers the weeds which are in themselves moisture robbers, and the broken soil improves by exposure to the sun and air. Thus we have the dry soil blanket not only checking evaporation and smothering weeds but also holding up the rain water when it is most required and at the same time gaining in its own power of fertility by exposure to the sun and air.

(c) *Systems of sylvicultural operations.*

109. (i) In range offices copies of the working plans in force within the limits of the range must be supplied and the Range Officer must study the systems laid down in the plan carefully. The Range Officer will instruct the Round Officers and Guards so far as their work relates to the directions laid down in the plans.

(ii) The most important systems (methods of treatment) by which forests are up to the present worked are :—

Permanent treatment.	High forest system.	Selection method.
	Coppice system.	Simple coppice. Coppice with standards.

Provisional treatment.	Improvement fellings.
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(iii) The influence of the method of treatment applied to a forest crop shows itself in the origin of the trees, in the form of the crop and in its state of vegetation.

1. Firstly, as regards the origin of the trees.—Their origin may be either natural or artificial. Natural regeneration may take place either by the natural dissemination of seeds, or else by means of stool-shoots. In the former case, the system of treatment is called that of high forest, and in the latter the coppice system. When the two are combined, a third, that of coppice with standards results.

2. Secondly, as to the form of the crop.—It may either be composed of trees of approximately the same age and size, in which case it is called the uniform or even-aged crop, or else it may be composed of trees of all ages and sizes forming

an irregular crop. A forest worked under the uniform method of high forest system, under the simple coppice method, would be constituted of a complete series of equal even-aged crops, while an area of forest worked by the selection method is composed entirely of irregular crops composed of trees of all ages intermingled.

3. Lastly, as regards the state of vegetation, which depends directly on the suitability of the species to the local conditions of soil and climate. Generally, the state of vegetation of any tree or crop is easy to judge from external appearances. Good height growth, well-developed crowns, healthy-coloured foliage and a clean bark all indicate a satisfactory state of vegetation.

(iv) *High forest system—Selection Method.*—(1) The selection method is a make-shift and consists in removing trees which have reached the size or age of exploitability, and of which the removal will either favour the growth of young trees already in existence on the ground beneath them, or will result in the appearance of seedlings from the germination of seeds of the desired species on the path of ground thus uncovered and exposed to the light. This method of treatment is simple, and most nearly resembles the action of nature. A certain number of trees, representing, as nearly as possible, the annual production of trees of exploitable size per unit of area, is fixed in advance and this number is annually extracted wherever they may be found. The dead, dying, diseased, damaged and inferior trees should be removed first. Then the mature trees of the prescribed girth, under which a good advanced growth of the principal species has sprung up should be removed. If these removals are not sufficient, the badly shaped trees and those with large spreading crowns should be cut even though of less girth than the prescribed one to allow sufficient light for the seedlings.

(2) In the selection worked forests regeneration is for the most part left to nature. The seed which falls naturally every year, or at short intervals of years, germinates and gives rise to young seedlings under the parent tree, or wherever the cover has been interrupted. This natural reproduction may, exceptionally, be supplemented, if necessary, by sowings and plantings. Since the entire area of forest is thus continuously undergoing regeneration, this method of treatment is to a large extent incompatible with the exercise of grazing rights.

(v) *Coppice system.*— (1) *Method of simple coppice.*— When a crop capable of throwing up stool-shoots is clear felled a simple coppice results.

(a) *Season of working.*—The best time for making the fellings in a coppice is the season at which the stools contain the largest quantity of reserve materials, i.e., during the season of rest, before the new leaves begin to appear. Coppice fellings should, therefore, be made in this country generally before March. If the fellings are made in the summer months, by which time all reserve material stored up in the tissues of the tree would be exhausted, the shoots would be weak, and would only have a very short growing time before the season of vegetative repose again comes round. The cold season, therefore, is the best time for coppicing because the resultant shoots are then the strongest and best-nourished, and have a whole season of growth before them.

(b) *Manner of felling.*—In cutting over a coppiced area the trees should be felled as close to the ground as possible, in order that the shoots which spring near the edge of the cut, may be close to the ground and thus be enabled to develop new roots of their own and become independent of the parent stool within a short time. Stems may be cut so that the stool slopes in all directions from the centre outwards, so that the edge of the stool may, everywhere, be as near to the ground as possible.

As far as practicable, the felling of the trees and shaping of the stump should be effected in a single operation.

(2) *Method of coppice-with-standards.*—(a) In a forest worked by this method of coppice-with-standards, the crop is composed of an understage simple coppice, in which certain trees are reserved as standards for bearing seeds and retained in order to grow a greater size. The reduction of the stock of coppice, entailed by the reservation of a certain number of stems, is compensated by the appearance of seedlings sprung from seeds borne by the trees overhead; and the larger the rotation the more numerous will be the seedlings, which thus help to keep the coppice fully stocked with the desired species.

(b) The standards constitute in many cases the more valuable part of the crop. In reserving standards at the felling of the coppice it is necessary to retain a larger number of trees than will ultimately be required, because the standards are always liable, when suddenly isolated,

to be blown over by the wind, or damaged in the fellings, or otherwise injured.

(c) In this method, the number of seedlings naturally produced will be larger, the coppice will grow to a greater height, the standards will have longer boles, and the production of timber will be greater than under simple coppice. The soil, too, being less frequently uncovered, will be better protected. The general conditions of the regeneration will be the same as in simple coppice, except that more seeds fall on the ground and more seedlings are, therefore, added to the crop.

(d) Forest treated by this method is little exposed to dangers (external) such as pest, drought, etc. Injury from attacks of insects is not much to be feared.

(e) But the disadvantages are (1) the shape of the standards is not so good as those grown in close crops, boles are shorter and not free of side branches as they grow mostly in isolated state and the quality of timber may be inferior. (2) The standards often suppress good coppice growth.

(f) The object of reserving standards is the production of larger timber, the supply of seed of the more valuable species and the protection of the soil and young growth.

(g) *As regards the origin of trees to be reserved as standards:—*(1) stems sprung directly from seeds should if possible always be selected in preference to old coppice shoots, on account of the greater vitality of the former, (2) if seedling trees cannot be found, young trees sprung from root-shoots should be chosen and, (3) failing these again, isolated stool-shoots grown on young stools. Shoots from old stools, though useful in the coppice, are very liable to decay and are not fit to be retained as standards. Lastly, the young trees to be selected should not be crooked or forked but straight, well-grown stems of good shape.

(h) The standards should always be kept in a state of complete isolation; that is to say, sufficient space must always be kept between the standards to prevent their branches from touching, and so closing the canopy. If too

many trees are reserved, and the crowns of the standards from anything like a complete canopy, the coppice undergrowth will be weak and thin and will not cover the ground.

(i) The number of standards which should be reserved on an acre of forest, is usually between 20 and 30, but varies necessarily with the object of management, with the species, the age, density and size of the standards, the rotation under which the coppice is worked, the soil, climate and the danger of fire, frost and drought. It is obviously advantageous to leave standards evenly distributed on the entire area.

CHAPTER V.

EXPLOITATION.

(a) *High Forest Felling.*

1. Marking of trees for felling.

110. (i) The Range Officer is responsible for the marking of trees, but may at his discretion allow a subordinate of rank not lower than a Forester to carry out the work under his written orders.

(ii) In the case of marking any trees for felling, the instructions contained in section 63 must be followed.

(iii) A separate series of numbers will be used for each compartment.

(iv) The minimum girth limit at breast height for sound trees may, in the absence of special orders, be taken at 7 feet. Except isolated trees, which must not be marked unless they are standing over trees or good young growth of the more valuable species, all trees that exceed the minimum girth limit should be marked.

(v) Badly damaged or unsound trees of less than the prescribed girth may be marked if they will give at least one sound log.

The following rules must be observed in marking trees for felling by different agencies :—

111. (i) *Trees sold standing* should be marked on a root or low down (so as to avoid the chance of the marks being removed in cutting the trees afterwards and trimming

the stools) with the Ranger's R stamp, a consecutive number and the year of marking—as R $\frac{5}{9-10}$.

(ii) *Trees to be exploited departmentally* should bear the R stamp of the range concerned, a consecutive number and the year of marking as above. Girdled trees should be marked the year they are girdled.

(iii) *Permit trees*.—Each tree to be marked with a consecutive number, the number of the permit and the year as well as the S stamp of the Round concerned as S $\frac{1-5}{19-20}$.

(iv) Particulars of trees marked under (i) and (ii) should be entered in columns 1 to 5 in the felling Register (form No. 5).

2. Girdling of trees.

112. The girdling officer shall be furnished with a map and a boundary statement of the area to be girdled over.

113. The girdling officer is personally responsible that the whole area allotted to him is thoroughly examined.

114. Before commencing girdling operations the compartment should be divided into as many sub-compartments as may be necessary according to natural boundaries such as roads, paths, nalas or other workable boundaries. The girdling should then be done in the serial order of these sub-compartments. A map showing the sub-compartments' boundaries should be made and kept with the felling officer. In the felling register a note should be made that Nos. 1 to 42 trees are in sub-compartment 1, Nos. 43 to 84 in sub-compartment 2 and so on. This would facilitate finding out any particular tree.

115. The girdling register will be pocket book size in the following form :—

Serial No.	Kind of tree.	Girth of tree at 4' 6" from the ground,	Estimate.			Remarks.
			Logs. c.ft.	Poles, Nos.	Sleeper pieces Nos.	

In the remarks column serious defects should be recorded; such as 'big hollow', 'very crooked' or 'badly fluted.'

116. On every tree girdled a large blaze will be cut as close to the ground as possible (in order that it may remain on the stump). If the tree stands on a slope it should be cut on the lower side; and, for preference it should be cut on a large exposed root or buttress. The blaze should expose sufficient heart-wood to take three impressions of the R stamp, the serial number and the year of girdling. An upper blaze will also be cut which need in the first instance expose sap wood only. On completion of the girdling the cooly will cut this blaze down to the girdle, exposing sufficient heart-wood to take the impression of the R stamp and the serial number. The girdling officer on satisfying himself that the tree has been effectually girdled will impress his R stamp and the serial number on the upper blaze, initial it, and enter the tree in his note book.

117. Trees should be girdled so as to expose a continuous belt of heart-wood 2 inches broad.

118. The particulars in columns 1 to 5 of the felling register (form No. 5) should be entered from the note book.

3. Extraction of trees.

GENERAL RULES FOR FELLING AND LOGGING.

1. *Felling.*

119. (i) Felling should be started along one boundary of the compartment bordering the previously felled compartment and continued in proper order through it.

(ii) Felling should be done by saw and as close to the ground as possible.

(iii) Every care should be taken to fell trees up hill as far as possible. To avoid breaks they should be felled so as to fall on bamboo clumps or useless species.

(iv) All girdled and dead trees must be felled. Those that it is thought cannot be felled without damage should be reported to the Range Officer for orders.

(v) Trees that in felling are caught on other trees and cannot be released should be reported to the Range Officer.

(vi) Felling should not be allowed in a fresh compartment before all work is finished in the previous one.

2. Logging.

120. (i) The following instructions must be observed in logging :—

1. Log where the tree forks or where the crown starts ;
2. Log at big side branches ;
3. Log where the girth changes ;
4. Log where there is marked bend ;
5. Cross cutting must be done with a saw.

(ii) After having logged according to the above instructions it may be possible to extract the logs without further cutting. It must be borne in mind that sound straight timber must be brought out in as long lengths as possible.

(iii) If further cutting is necessary begin from the bottom end of the log. If there is a hollow at the base, log the first log to include the entire hollow portion.

(iv) Sound straight timber of good quality should be logged to the longest lengths that can be extracted. If it is necessary to cut up lengths of this class the orders of the Divisional Officer should be taken.

(v) No logging may be done except at the felling site. No log may be cut into two nor may any pieces be cut off a log after it has been dragged from the stump.

(vi) No marketable timber may be wasted when logging.

121. No butting of any felled trees is allowed except the hollow bottom end then only under the following conditions :—

(i) that the length of the butt does not exceed 7 feet ;

(ii) that the butting is done at the stump ;

(iii) that the portion cut off contains no marketable timber.

Hammer marking logs.

122. Both the faces of the log must be marked showing—

1. Block number	X
2. Compartment number	4
3. Stump number	10
4. Log number	1
5. Year	19-20.

These chisel marks should then be painted with coal-tar or better still if a portable coal-tar pad be made, the chisel when pressed on to the pad before numbering makes a clear and more lasting print on the log. This would also save time.

123. (i) The directions for filling up the felling register given in Appendix XVI to the Forest Manual, Vol. I, must be strictly observed.

(ii) A copy of these will be stitched in with the register.

Measurement of felled trees and logs.

124. Length—

(i) For measuring length graduated tapes should be used.

(ii) The length of a felled tree or log is measured along, or parallel to its axis, and not on its sloping surface. The sectional area of a log or tree can very rarely be obtained directly. In nearly every case the girth or diameter midway between the ends of the log must be measured and the area of the section determined as if the section were a circle. The established custom is that in the sale of timber, the square of the quarter girth should be regarded as the sectional area of the log or tree. Therefore, area is $\frac{22}{7} \times \frac{\text{diameter}^2}{4}$ or according

to custom $\left(\frac{\text{girth}}{4}\right)^2$.

(iii) The measurements of the length should be taken as if the logs were cross-cut at the ends with a

saw. If the logs are not so cross-cut the measurement should be taken between the points at which the ends would be cross-cut.

(iv) In the measurement of logs containing drag holes at either or both of the ends an allowance should be made on the measurement of .33 of a cubic foot for each drag-hole, *i.e.*, if there are holes at each end of a log the allowance should be .66 c. ft., if at one end only then .33 c. ft. should be allowed.

(v) Lengths should be taken to the nearest quarter foot and when the fraction of a quarter foot is exactly $1\frac{1}{2}$ " or less the lower quarter foot should be read. For example —

Actual length	Should read
25' $7\frac{1}{8}$ "	25 $\frac{1}{2}$ '
25' $7\frac{1}{2}$ "	25 $\frac{1}{2}$ '
25' $7\frac{3}{8}$ "	25 $\frac{3}{4}$ '

125. Girth—

(i) Girths are measured with a tape, and diameters with a calliper.

(ii) Diameters or girths shall invariably be taken midway between the ends of the log.

(iii) In the case of elliptical or oval stems, take the mean of the smallest and largest diameters.

(iv) In the case of large stems, measure at least two diameters or girths, and take the mean.

(v) In the case of stems or irregular contour, measure several diameters or girths, and take the average, and avoid all protuberances, etc.

(vi) Measure diameters or girths always in a plane at right angles to the axis of the stem.

(vii) If the place of the measurement falls on an irregular part of the stem, measure the diameter or girth, as the case may be, at an equal distance on either side above and below the irregularity, and take the mean of the two measurements.

(viii) Moss, etc., thick enough to vitiate the measurement of the log should be removed.

(ix) Bark should be removed at the place where the tape runs.

(x) The place where the diameter or girth is taken should be marked with a chisel or axe for further checking.

(xi) Girth should be taken to the nearest inch and when the fraction of an inch is exactly $\frac{1}{2}$ " or less, than that, the lower inch should be read. For example—

Actual girth	Should read
6' $3\frac{1}{4}$ "	6' 3"
6' $3\frac{1}{2}$ "	6' 3"
6' $3\frac{3}{4}$ "	6' 4"

In green timber, owing to shrinkage, any fraction of an inch in the girth may be disregarded and in no case should allowance be made in the total or quarter girth for bark, etc., which should be removed beforehand.

(xii) There are two ways of calculating the quarter girth from the total girth:—

(i) reduce all the feet to inches and divide it by 4: example, $5' - 6" = \frac{66}{4} = 16\frac{1}{2}"$ quarter girth;

(ii) multiply the number of feet by 3 and divide the further inches by 4; add them together, the result will be the quarter girth in inches: example: total girth is $5' - 6"$ then $5' \times 3' + \frac{6"}{4} = 15 + 1\frac{1}{2} = 16\frac{1}{2}"$ quarter girth.

126. All hollows and other defects are estimated by eye. Suppose in a log, there is a hollow from one end and fluting in four places on the body of the log, then thrust into the hollow a piece of iron rod or wood to see how far it extends; from the length obtained calculate this to be about, say, 2 cubic feet, then carefully go round the log to examine the defects, say $1 = \frac{1}{2}$, $2 = \frac{1}{4}$, $3 = \frac{1}{4}$, and $4 = \frac{1}{2}$. Add up all these together, viz., $\frac{1}{2} + \frac{1}{4} + \frac{1}{4} + \frac{1}{2} + 2 = 3\frac{1}{2}$, i.e., 3.50 cubic feet. Then if the measurement of the log is 20 feet long, 13" quarter girth

Cubic feet	..	23.47
Deduct for hollows, etc.	..	3.50

Real volume of the log	19.97
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Measurement of square cut timber or scantlings.

127. Such timber must of course be cubed by the formula ; Length X width X thickness.

Measurement of Small Wood.

128. (i) The most rapid way of measuring small wood on a large scale is to stack it cut up into billets of one and the same length, the width of each stack being equal to the common length of the billets. The contents of a stack will be equal to length X height X common length of the billets.

(ii) The following figures may be accepted as average reducing factors for converting stacked into solid contents:—

For splitwood	..	..	0·80.
For round billets	..	..	0·65.
For small stuff	..	..	0·45.
For wood from stumps and roots	..	..	0·40.

(iii) In connection with the determination of the solid contents of the stacked wood it is obvious:—

(a) that the longer the billets are, or the less carefully built up the stacks are, the less will the solid contents be. In careless stacking billets often lie across one another ;

(b) that the thicker or more regular shaped the billets are or the more carefully built up the stacks are, the greater will be the solid contents.

Poles.

129. Poles are generally not of regular shape. Their value does not depend on their cubic contents, but on the shape, thickness and length. Therefore, it is enough if record is kept of the length and thickness (diameter or full girth) with regard to this class of produce.

Sale Depot.

130. All material exploited departmentally will be brought to the sale depot. At every such depot the registers, etc., prescribed in Appendix M will be kept.

131. The first essentials in a sale depot are neatness in arrangement and facilities for stock-taking. These can be secured in the following manner:—Different areas to be assigned for stacking different kinds of timber and each such area to be sub-divided for the timber of different contractors. There should be timber of each kind in one place to enable both the seller and the customer to find things easily and timber of each contractor in one place to facilitate rendering of contractor's account as well as stock-taking.

Register of receipts.

132. (i) Where more than one division is concerned a separate register should be kept for each division.

(ii) The serial number in each register should commence from the date of close of the last sale.

(iii) A lot should consist of one bottom log (which should not be first class) or pole and all the logs or poles resting on it. As soon as a lot is completed it must be entered in the register of disposals (form No. 8).

(iv) Against each log in the 'remarks' column the serial number of the lot of the register of disposals should be entered.

Register of disposals.

133. (i) The entries in columns 4 to 9 of this register in respect of each log should tally with those in columns 5 and 9 to 13 of the register of receipts.

(ii) The price of the whole lot must be paid before a single log is removed.

(iii) In column 12 the amount of sale with the Dr. item No. of the cash book under which it was credited should be entered.

(iv) In the remarks column the number of pass under which it was removed and its date should be entered against each log.

(v) This pass should tally with the counterfoil in the pass book.

Stock-taking.

134. This should be effected by checking the stock of unsold logs on the ground with (a) the balance of incomplete lots in the register of receipts which has not been transferred to the register of disposals and (b) the balance of lots remaining undisposed of in the latter register.

Sales.

135. These should be held at regular auctions only, the prescribed conditions of sale being duly adhered to.

Bill-book.

136. Bills should be issued immediately on confirmation of any bid. Each payment should be endorsed on the back of the bill with the Dr. item No. of the cash book.

Receipt book.

137. Receipts should be issued for payments received otherwise than under a bill. These should be traced in the cash book.

(b) Coppice felling.

1. Laying out of coupes.

138. The following instructions should be observed by Surveyors:—

(i) All coupes due to be exploited in one season must be surveyed and marked out on the ground as indicated on the maps by the divisional surveyor in the previous working season.

(ii) He should invariably report himself to the Range Officer before commencing work and take his instructions.

(iii) The Range Officer should supervise the work as much as possible, make all necessary inquiries concerning the charges shown by the surveyor in his account and assist him in procuring labourers.

(iv) The demarcation of the outside boundary of a coupe should be effected in the following manner:—

(a) The specification of boundary marks should be the same as laid down in section 47.

(b) Cairns of class I should be placed :

(1) at the chief angles of the outside boundary ;

(2) where a village boundary intersects the forest outside boundary ; and

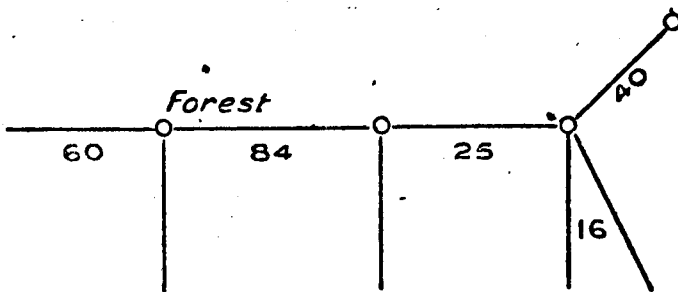
(3) where a compartment boundary intersects the outside boundary.

(c) Cairns of class II will be placed on outside boundary :—

(1) at small corners ; and

(2) at places where boundary marks are necessary in order that preceding and succeeding cairns on the same boundary may be visible supposing there were no trees ;

(3) where two or more boundary lines of outside survey numbers meet as shown in the following diagram—



(d) When demarcating coupes, the surveyor must see that the existing cairns on the outside boundary line are (1) in right places and (2) in proper repair and (3) whether any are wanting according to the foregoing rule and set right all deficiencies.

(e) The demarcation of the inside boundary of a coupe should be done as below :—

(a) The marks on the boundaries which divide up a block into coupes are to be 'uralis' (mounds) of the following specifications:—

6 feet long at base.

3 feet broad at base.

1½ feet broad at summit.

3 feet high.

The method of building 'uralis' should be similar to that of building cairns which is laid down in section 47.

(b) *Uralis* are to be placed:—

(1) at all corners; and

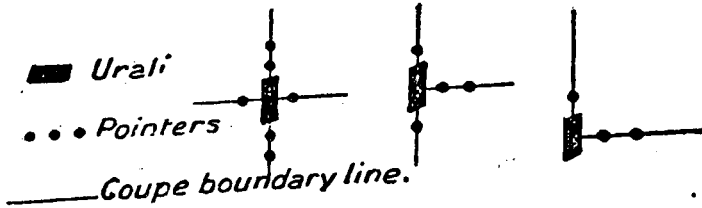
(2) at places where boundary marks may be necessary in order that the preceding and succeeding 'uralis' on the same boundary may be visible supposing there were no trees;

(3) except at points where three or more coupes meet *uralis* are not required where the coupe boundary is a macadamised road, or a well defined stream of over two chains in breadth;

(4) where the coupe boundary is a stream less than two chains in breadth it is not necessary that one *urali* should be visible from the next. It is sufficient that the *uralis* should not be more than 20 chains and not less than 10 chains apart.

(c) *Pointers*.—To show the direction of the boundary a large stone (pointer) should be firmly fixed on the boundary line at a distance of one pace from the outside of the *urali*, one foot of this stone should show above ground and 1½ feet should be buried. In some cases two pointers will be required, 1st pointer will then be at a distance of one pace and 2nd at a distance of two paces from the boundary marks.

Examples.



The pointers on *uralis* should be painted in the same manner as on the cairns, *vide* section 47.

(vi) *Revenue Survey uralis*.—The old *uralis* of all survey No. boundaries inside the forest should be pulled down. Each cairn and *urali* should be marked separately on the block map in pencil and on the coupe map in ink thus :—

Cairns class I	0
„ „ II	0
Urali	■

(vii) Serial Nos. to cairns, *uralis*, intermediate stones and boundary trees :—

(1) Each boundary mark must be clearly numbered on the indicator (top stone) with paint made of oil and *shendur*.

(2) No two cairns or *uralis* of any one block should have the same serial number and when once a cairn or *urali* has been given a number this number should be entered in the map and should never be changed.

(3) The number of cairns or *uralis* of coupe 1 should be the first cardinal number, those of coupe 2 the next cardinal number and so on until the whole of the cairns and *uralis* of one block have been numbered.

(viii) *Intermediate stones*.—At every chain length of the boundary a stone should be firmly fixed in the ground and the projecting portion painted red ; 9 inches or more of such stone must show above the ground and it must be firmly embedded so that no animal may displace it.

If the boundary happens to be a stream less than one chain in breadth, the stone must be inserted on alternate sides of the stream, the first stone on one side and the second on the other and so on. If the stream be more than one chain in breadth then intermediate stones and boundary trees will not be required but cairns or *uralis* and pointers must be erected as usual.

(ix) *Boundary trees*.—(1) All trees not less than 6 inches in circumference either on or within 6 feet of the boundary lines on the outside of the coupes are to be marked as boundary trees. The marking should be commenced from cairn or *urali* No. 1 and proceeded on to No. 2. A register of boundary trees should be kept in the following form :

Cairn or urali.	Serial No. of tree.	Kind of tree.
-----------------	---------------------	---------------

(2) If large enough, the trees should be marked with the serial No. at breast height, *i.e.*, 4 feet from the ground in red paint and immediately below this must be a ring of red paint not less than 4 inches in breadth and reaching right round the tree : if not large enough to receive the number, two rings of red paint 6" apart should be applied instead of one ring and the serial number ; if the bark of the tree be rough, the rough portion should be scraped off with a *kovita* so as to leave a smooth surface for the painting ; the rough portion only of the bark must be scraped off, for if the bark is scraped right through the wood in any place the tree will be damaged.

(3) All karvi, bamboos and bushes which are on the compartment line are to be cut down but no tree on the compartment line is to be felled.

These karvi, bamboos and bushes are to be cut within 6 inches of the ground but their stumps need not be trimmed.

(x) *Demarcation when stones are not obtainable*.—

(a) *Cairns and uralis*.—In cases where stones cannot be obtained the boundary marks should be erected of earth.

The earthen cairn or urali must not be composed of unbroken blocks of earth but if necessary the soil

used must be broken into small pieces ; it will be well to beat the sides and the top of the cairn or urali thoroughly with a spade so as to make the mound as compact and firm as possible. After well beating with a spade the the cairn or urali as the case may be should be of the following dimensions :—

<i>Cairns.</i>	<i>Urali.</i>
height $3\frac{1}{2}$ feet.	height $3\frac{1}{2}$ feet.
diameter at summit, $1\frac{1}{2}$ feet.	length at summit $4\frac{1}{2}$ '.
	Breadth at Do. $1\frac{1}{2}$ '.

(b) *Intermediate marks and pointers.*—(1) *Intermediate marks.*—At each chain's length a ditch 3 feet long, one foot deep and one foot broad should be made ; these ditches will take the place of intermediate stones.

(2) *Pointers.*—To take the place of the stone pointer a ditch similar to the above should be made on the boundary at one pace distance from the cairn or urali.

(xi) The surveyor shall divide the coupes into sub-coupes. The first sub-coupe in a new coupe should border on the last worked coupe. The boundary of the sub-coupe must be shown by whitewash rings on border trees, white paint must be used during the monsoon.

(xii) Not more than 6 coolies should be employed on coupe marking work :—

2 on chain work.

2 on work with crowbars.

1 on collecting stones and building cairns.

1 on marking boundary trees and clearing boundary line with the help of the first four.

Wages to coolies should be paid at the rates certified by the Mamlatdar. The certificate should be attached to the muster-roll.

(xiii) Not less than 8 coupes (not exceeding 100 acres each) should be laid out each month by the surveyor.

(xiv) On the completion of work of each coupe the coupe map with the lists of cairns and uralis and boundary trees should be submitted to the Divisional Officer.

2. Preservation of standards in coupes.

SELECTION OF RESERVES.

139. The chief objects and advantages of the method of coppice with standards have been explained in section 109 (v) 2.

The selection of standards in the coupes of any reserve will be governed by the prescriptions of the working plan for that particular reserve. Where a working plan does not exist the selection of standards will be governed by executive orders of the officer in charge.

Numbering and making of standards.

140. The following rules should be observed :—

(i) The reservation officer must commence work along one boundary of the coupe and work backwards and forwards in parallel lines from that boundary till the whole coupe is finished ; i.e. he should first reserve the necessary trees in a strip of 33' wide round the coupe starting at a convenient point say at cairn No. 1 (*vide* sketch in Appendix D) writing on the numbers so as to face the reserving officer as he goes forward ; then take up a strip 33' wide parallel to any side and, when this is finished, return in the opposite direction reserving trees in the next strip of the same width. In this way he should proceed through the coupe the numbers in the alternate strips facing in opposite directions.

(ii) Each reserve tree of 9" girth and above should be numbered with a tin plate $1\frac{3}{4}" \times 3\frac{1}{2}"$ and have one broad ring of tar painted round the stem at breast height. Those below 9" should have a tarred ring only. Before the ring is put on enough of outer bark should be scraped off. The nails should not be driven home into the tree but a little left projecting to allow for the growth of the tree: otherwise the tin plates fall off in one year.

(iii) When it is necessary to reserve a tree composed of several shoots, all the shoots should be reserved and (a) if the fork is below breast height, each shoot should be marked with a ring and separate number; (b) if the fork is above breast height one ring and number will suffice.

(iv) A register of standards should be written up in the form given in Appendix E wherein a note should be made as shown as to the exact position of the number of the tree which begins and ends any one strip.

NOTE.—The arrangements prescribed in rules (i) and (iii) will facilitate the tracing of a given tree within the limits of its strip and between the backward and forward serial number.

(v) Whenever mistakes in reservation have to be corrected, whitewash or chalk should be used for marking any trees changed to show which part of the coupe has been gone over, but standards will be marked just as previously with tarred rings and tin plates.

(vi) The reservation should be completed by the end of January at the latest so that the establishments may be able to concentrate their attention on fire protection between February and May.

(vii) The Range Officer must inspect the standard reservation when finished, correct mistakes and certify all is right.

141. Preservation of standards.—Standards will play so important a part in the future well being of the forest, not only as forming the stock of large sized timber to be worked out in the second rotation, but as parent trees by whom the stocking of the forest should be constantly replenished, that attention should be paid to one or two points in connection with them.

(a) Standards cut or damaged when felling work is in progress should, if possible, be replaced by the best obtainable substitutes.

(b) Penalties imposed on contractors for cutting, damaging or allowing standards to be damaged should be enforced, in order that the value set upon these trees may become widely known.

(c) *Lopping of Standards.*—On no pretext whatever should standards be lopped for rab material. If the offence is committed,

and the actual offender is not caught the matter should be brought to the notice of the proper authorities.

(d) *Standards broken by wind, stolen, etc.*—Stools should be cut flush with the ground as soon as the damage is discovered.

(e) *Distribution.*—Even distribution of standards is advantageous as it renders the detection of losses by theft, etc., even upon rapid inspection, much more likely than when standards are kept in groups.

(f) *Stock-taking.*—A systematic counting of standards in the compartments under reproduction should be undertaken at least once in every three years until the young growth has reached such a height that the standards cannot readily be distinguished. Results of countings should be compared with the original list of standards reserved, and all discrepancies be carefully recorded in the control book, cause of casualties whether windfalls or from theft being noted.

3. Working of Coupes.

142. (i) The sale of coupes should be completed not later than the first week of June and the felling operations commenced on 1st July and completed by 31st March. By this arrangement contractors will have sufficient time for their work and no excuse for asking for extension. The whole of the following April and May will be available for inspection and correction of the bad condition in which the coupes were left.

(ii) The Range Officer or Round Officer must go over the coupe with the contractor and mark the boundary trees with one black ring below the red rings originally put on before handing over charge of the same to the contractor. The contractor must sign the certificate in the form in Appendix F.

(iii) Working of sub-coupes should be according to the order laid down in the coupe tracing and the Range Officer may only allow deviations for strong reasons.

(iv) A duplicate copy of the coupe map showing the sub-coupes and the register of standards should always be kept in the cutting and produced for inspection when any officer visits the coupe.

(v) Felling will only be allowed in one sub-coupe at a time. On completing felling work in any one sub-coupe the contractor may commence felling in the next sub-coupe and so on, provided all stools, etc., are correct in the previous sub-coupe and no work of any kind is carried on in more than two sub-coupes at the same time.

(vi) All stools must be levelled with the ground at once and trimmed so that water cannot lodge upon them. The felling officer should hammer-mark \uparrow the property cut and trimmed stools.

(vii) All living, broken or injured trees and all half dead or crooked and stunted small trees must be levelled with the ground.

(viii) No branches or chips, etc., may be left lying within $1\frac{1}{2}$ feet of a stump so that no impediment may be caused to the springing of new shoots.

(ix) When the number on a standard cannot be read, the felling guard should write a number above where the old number was and make a note in his standard list. The remains of the old number should not be scratched off or interfered with.

(x) Whenever a standard is broken in spite of all possible care it should be replaced by a standard marked with red cross and in the absence of the latter by a good sound tree standing as near as possible to the broken standard and a record of it kept in the form given in Appendix G. The register should be dated and signed by the felling official daily. The Ranger must make a remark opposite the entry of the broken standard in the register that the tree has been handed over to the contractor.

(xi) The felling guard must put the number of the broken standard on the red cross tree substituted with the letter A in front of the number and in the remarks column opposite the number of red cross tree state the number of the standards which it substitutes.

(xii) The handing over to contractor for felling of excess red cross standards not needed to replace break-ages should be done as soon as any sub-coupe is finished and before the next sub-coupe is commenced.

(xiii) Care should be exercised that shoots are not damaged by dragging carts, logs, branches, etc., over them.

(xiv) Contractor's cattle, while employed in extracting material from a coupe, should be muzzled, or at all events should be tied up when not actually working. Coppice shoots suffer severely from the non-observance of this rule; it is one which should be strictly enforced.

(xv) No camp-fires should be permitted in coupes under exploitation. Charcoal-burning, if allowed within the limits of a coupe, should be done on carefully selected open spots, which, when the operation is completed, should be broken up with a pick and sown with suitable seed. Relative proportions of species in stock may here be considered. All coupes under exploitation should be safeguarded by fire-traces.

(xvi) The contractor should be required under clause (d) of the agreement to entertain a watcher on Rs. 9 a month in the coupe from the date the felling operations are commenced till the coupe is handed back to the Forest Department. The watcher will be under the Range Officer's orders. The pay of the watcher will be disbursed by the Range Officer after recovering it from the contractor. The principal duty of the watcher is to guard the cutting against fire and cattle. He may, in addition to these duties, supervise the contractor's work in the cutting. The form of order is given in Appendix H.

(xvii) The Round Forester should inspect the coupes in his round as often as possible. In a round where there are only two coupes or less, each should be inspected once a week.

(xviii) When inspecting a coupe the Round Forester must tick off in the cutting guard's list with a blue pencil the standards he has inspected. The standards he inspects must be consecutive numbers and opposite the last number inspected he should put the date of inspection. While checking the standards the number on each tree must be crossed out with chalk.

(xix) The cutting guard must show to the Ranger all the standards broken by the contractor since his last inspection and when standards are badly broken, the Ranger must make a remark in the guard's list opposite the number.

of the broken standard to the effect that the standard has been handed over to the contractor to cut.

(xx) In case the working of the coupe by the contractor is unsatisfactory the Round Forester must report immediately to the Range Officer who should inspect the coupe at once. If he finds the work is badly done, he should serve on the contractor ten days' notice in the form prescribed in Appendix I to make the necessary improvements and should he fail he should get the work done departmentally and charge it to the contractor's account.

(xxi) The Round Forester should make certain that the contractor uses his stamp to mark the timber obtained from his own coupe only, and no other. The felling guard must see that all timber leaving the coupe is marked with the contractor's stamp and that no forest produce is removed from the coupe without written permission of the Divisional Officer.

(xxii) The felling guard should keep a felling register in the form given in Appendix J. He should fill in it after personally measuring all timber and firewood prepared in the coupe adopting the table of calculation given in Appendix K. An abstract of this register should be submitted to the Divisional Officer soon after completion of the work.

(xxiii) Within eight days of the expiration of the period laid down in the terms of the agreement for evacuation of the coupe by the contractor or such earlier date as the contractor may desire to deliver over charge, the Range Officer shall forward to the Divisional Officer a certificate in form given in Appendix L, signed by himself or his Round Officer, accompanied by the statement of standards broken mentioned in clause (x) above. In the event of the Range Officer not having taken over the coupe from the contractor he is to visit the same within one fortnight and report whether the Round Officer's statement is correct.

(xxiv) The Range Officer and Round Officer should give the dates of final inspection on the coupe completion certificate as they will be held liable for any expenditure incurred on incomplete work found after the certificate has been passed.

(xxv) While taking over the coupe from the contractor his marking hammer must be defaced in the presence of the Range Officer.

(xxvi) On taking charge of the coupe from the contractor, the Range Officer must immediately cut and collect outside the coupe at the contractor's expense (out of his deposit) all standards the leading shoots of which are broken or too severely injured. Broken branches of slightly injured standards should be neatly cut off close to the stem and tarred, also at the contractor's expense.

(xxvii) After a coupe is exploited the following considerations should be given effect to:—

1. Removal of branch, and brushwood, leaves, and grass by villagers should be properly supervised to prevent damage to stool-shoots and standards, and on no account should the use of rakes be allowed.

2. A rough estimate of the size of any blank or blanks occurring in a coupe should be made by the Range Officer and submitted to the Divisional Officer, together with a brief description of the locality, position soil, etc., to enable the latter to decide how the land shall be treated. Ordinarily such land should be broken up to some extent and sown with a mixture of seeds of kinds known to thrive well in the particular locality. Ploughing will be required where the blanks are expensive.

MISCELLANEOUS.

(1) *Felling on permits.*

143. The rules regulating the issue and execution of permits for timber and other forest produce given in Appendix VII to Forest Manual, Volume II, should be strictly observed by the subordinates concerned.

(2) *Use of pass-books.*

144. The use of pass-books should be strictly regulated. They should not be issued by any subordinate unless authorized by the Divisional Officer.

The following alternatives should be observed :—

(a) In the case of material removed on permit no separate pass is necessary. The purchase certificate (form No. 15 B) will serve the purpose.

(b) For all material removed by coupe and farm contractors the contractors should be authorized to issue their own passes under agreements.

(c) In the case of petty sales in forests the Range Officer or the Round Officer holding the sale shall issue passes.

(d) (i) In the case of wood from malki and inam lands, passes may be issued by the village patil and the inamdar, respectively, when the lands are situated far away from Government forests, say 15 miles. Otherwise the Round Forester or other specially deputed guard may issue them.

(ii) Pass books to contractors and others authorized to issue passes should be given by the Range Officer.

(iii) All pass books used or unused issued as above should be taken back by the Range Officer immediately on the expiry of the period of authorization.

(iv) Passes should be given either at the starting station or in the forests or at depôts before any material is actually removed.

(v) Twenty-five per cent. of each class of passes issued by subordinates and contractors in one season should be examined by the Range Officer and the fact noted at the end of his diary.

(3) *Licenses for sawing timber.*

145. The following procedure should be observed :—

(i) Applications for saw pit licenses will be received by the Range Officer.

(ii) The Round Officer will inspect and report to the Range Officer on the application.

(iii) The Range Officer will then return the case to the Round Officer with the license if deemed fit.

(iv) The latter will deliver the license to the Beat Officer only for supervising the operations.

(v) After the operation, the Round Officer should remeasure the *pieces* sawn, which should be kept intact tied up in their original form and not split up, enter their measurements on the back of the license and return the license together with the case to the Range Officer.

(vi) The Range Officer will affix the license to the counterfoil and place the case on the file.

(4) *Description, use and custody of hammers.*

1. Object of stamps.









146. The object of stamps is more for the internal management of divisional works and contracts than for the identification of timber after disposal. Marks and stamps used for internal management will very generally suffice for any posthumous identification. All Government timber disposed of will bear one or the other of the marks mentioned in section 149. When it is private there is always a registered private property mark on each log. If there is not, there need be no question as to whom the wood belongs: it is according to law the property of Government if nobody can prove undisputed right to it.

147. The Forest Department stamps, therefore, should be of such a nature as to prevent irregularity and fraud within each division itself. One of the great uses of stamps is the check they afford over the work of subordinates, insuring regularity of procedure and the systematic execution of departmental markings, permits, contracts, etc., in consequence. If every tree destined to be cut or exploited in the Government forest were properly marked at the time of girdling, reserving or selling there would be very little fraud, or irregularity possible and the work of inspection immensely simplified. When each log that comes out is stamped into the bargain, fraud is next door to impossible with a reasonable amount of inspection.

2. Designs of stamps.

148. It is inadvisable to have too many different sorts of stamps or to allow the same stamp being used for very

different purposes in different divisions and even in different ranges of the same division. This will reduce the value of stamps and create a certain amount of confusion in the minds of subordinates who were transferred from place to place. In order to obviate complications to ensure both uniformity in the description of stamps and facility for distinguishing the produce of one division from that of another, it is necessary that each division should have its own form of frames for all its stamps as given below, the edge of the frame being raised for cutting into the wood:—

<i>Poona</i>		<i>Semi ellipse.</i>
<i>Satara</i>		<i>Ellipse.</i>
<i>Kolaba</i>		<i>Sector of Circle.</i>
<i>West Khandesh</i>		<i>Circle.</i>
<i>East Khandesh</i>		<i>Square.</i>
<i>North Khandesh</i>		<i>Triangle</i>
<i>North Nasik</i>		<i>Octagon</i>
<i>South Nasik</i>		<i>Hexagon.</i>
<i>and so on.</i>		

3. Impressions and uses of stamps.

149. The following are the impressions and uses of the various stamps used by the different officers:—

E.—Examined—To be exclusively used by the Divisional Officer for marking timber of all descriptions,

contract, permit, confiscations, etc., in course of his inspection.

R.—Ranger—To be used by the Range Officer for the same purposes.

F.D.—Forest Department—For marking timber sold in depôts before it is exported. To be kept by the depôt officer.

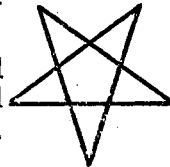
S.N.—Survey number—For timber cut in and exported from malki numbers. To be kept by the Range Officer, or, when authorized, by the Round Officer

S.—Sales—For marking any timber removed on permit, whether free or on payment, or disposed of on petty sale in the forest or from standing coupes. To be kept by each Round Officer so as to enable it to be known from which round any particular wood comes. The stamp should have the distinguishing letter or letters of the range in the upper loop of the S and the number of the round in the lower loop. Rounds will, for this reason, be known in each range by consecutive numbers.

Broad arrow—For all confiscated timber. If afterwards sold locally it will be marked in addition with the S stamp of the round concerned. Both Round Officers and Beat Officers should carry this stamp. In the case of the latter the stamp should be on the axe.



Release—For release of seized timber. To be kept by each Round Officer.



• CHAPTER VI.

PROTECTION OF FORESTS.

150. The chief unfavourable external influences against which forests need to be protected by measures either preventive or remedial are:—

- (i) Fire.
- (ii) Grazing.

Injuries from climbers, weeds and unsuitable soils have already been dealt with, and injury from animals, other than domestic, is of little practical importance, while protection against dangers of injuries due to human agency only incidentally finds place in a work on silviculture.

1. Protection from fire.

151. Injuries due to fire :—

(i) The undergrowth, including seedlings and often saplings, may be destroyed. Generally newly worked coupes suffer most and older grazed forests least.

(ii) Large trees are killed or materially injured rendering them more liable to other external, injurious influences.

(iii) The growth of tall grasses is much increased thus hindering natural reproduction.

(iv) The formation of humus is impossible and the quality of the soil continually deteriorates and may become unsuitable as a seed-bed.

(v) The soil (especially clay soil) becomes baked and hardened by the action of the heat.

(vi) The ground is exposed to erosion. The rain water is not absorbed, the streams are not regularly fed, and floods are liable to occur.

(vii) Landslips and hill-torrents are formed owing to rapid currents of rain water falling on bare, baked and hardened soils.

(viii) A large quantity of seed is entirely destroyed.

(ix) The total yield of the forest becomes smaller.

Origin of fires.

152. Fires generally originate from :—

(i) the deliberate firing of forests by Dhangars, gowlis, and villagers under the belief that, by the action

of fire, an early and more vigorous growth of grass is secured ;

(ii) travellers throwing away the still burning end of their cigars into the dry and inflammable grass and leaves on the sides of roads and paths which lead through forests ;

(iii) travellers cooking food inside a forest reserve and proceeding on their journey after their meal without extinguishing properly the fire ignited by them ;

(iv) the rayats set fire to the grass in the fields adjoining a forest and let it run into the forest under the belief that the ashes, etc., will be washed down into their fields and serve as manure. Generally, the fields are situated below the level of the forest ;

(v) sparks from engines of passing trains igniting grass ;

(vi) shikaries starting fires in order to hunt game ;

(vii) wild tribes and wadders setting fire to the grass round " earths " in order to smoke out rats, etc., and allowing the fire to extend and burn regardless of consequences ;

(viii) rayats setting fire to vegetation near the edge of their cultivation to destroy cover for tigers, panthers, bears, pigs, snakes, etc. ;

(ix) the burning of tall grass in big forests by jungle people and travellers in order to destroy cover for big game such as tigers, panthers, bears, pigs, etc., or to destroy ticks and leeches ;

(x) travellers carrying torches carelessly through the forest ;

(xi) highway robbers, dacoits, etc., setting fire to the forests to destroy thorns, etc., and to enable them to move about noiselessly ;

(xii) evil-disposed people, to spite a contractor or forest guard or a fire establishment, setting fire to forest to bring them into trouble ;

(xiii) mohra gatherers as also collectors of minor forest produce, in order to clear the ground below the

trees of which the produce is required, setting fire to the area and letting it to extend into the forest regardless of consequences ;

(xiv) forest contractors' establishments setting fire to the forest to burn thorns, etc., to facilitate movement, or merely causing fires through carelessness.

Preventive measures.

153. The principal means by which forests are protected from fire are :—

(i) by securing the willing co-operation of the neighbouring villagers in trying to exclude fires ;

(ii) by appointing a staff of fire watchers ;

(iii) by establishing fire stations on prominent and convenient hills with drums and flags ;

(iv) by clearing external fire lines to prevent fire from entering the forest from outside ;

(v) by making internal fire-lines by which to control and localise any fire that may occur within the protected area

(vi) by setting apart specially burnt and fire-traced camping grounds for halting and cooking places for carts.

154. *The good will of the people.*—This is always an essential to success in any attempt to prevent fires ; it is always easy to start a fire in a forest in the dry season, without much fear of detection and, if neighbouring villagers for any reason wish to burn a forest no preventive measures, however costly and elaborate, are likely to save it. The co-operation of the people in carrying out operations may be obtained in various ways :—

(i) by preventing the subordinate staff from oppressing the people ;

(ii) by rewarding and punishing, communally or individually, for co-operation and obstruction respectively. Amongst rewards may be mentioned free grants of wood for house building or for agricultural implements, grazing at reduced rates or entirely free,

presents of bangles, puggris, ornamented coats, etc.; while punishments would include strict closure of all burnt areas for at least two years, impounding of cattle found trespassing in such areas and recovery of prohibitive compensation, enhancement of grazing fees and curtailment or stoppage of all forest privileges for a year or two ;

(iii) by the wide publication of annual notices explaining to the villagers exactly what acts, in connection with fire, are prohibited or permitted in forest. Information should be also given in each forest village by beat of drum ;

(iv) by attention to the local people's wants, especially as regards the supply of forest produce, whether on payment or free, provision of forest labour during the agricultural slack season and in any other way in which it may be possible for the Forest Department to assist ;

(v) by insisting upon the activity of the forest establishment.

Fire-watchers.

155. Patrolling of the fire lines is indispensable to successful protection from fire. The duty of the fire-watchers is to constantly patrol the lines and keep them swept clean, to prevent the carrying or making of fire within or in the vicinity of the protected area, to be on the look out for fires and to proceed instantly to the scene of any fire that may arise within or near the forest. Each watcher can patrol about 3 to 5 miles, and it is convenient to arrange that he meets with his patrol neighbours at least once a day. When a fire occurs the first duty of the watcher is to collect any assistance available and endeavour to overcome the fire and arrest the offender. When the fire has been extinguished the boundaries of the area burnt should be inspected to see that there is nothing still alight, and that all burning logs, etc., have been extinguished.

Fire stations.

156. (i) The main object of fire stations is to spread the earliest information of danger to forest from fire and

to warn the adjoining villagers and forest subordinates to proceed to the threatened point without delay. With this view fire stations should be established on prominent and convenient hills so that a large area of forest can be watched from them. They should also be central, so that they can be seen and the alarm drums heard from as many villages as possible.

(ii) In each fire station 1 or 2 fire guards, according to the circumstances, will be stationed. A platform is built on a high tree near the station and the guard on watch must frequently climb up and look out for fires. If no tree is available, watch may be kept from the nearest high rock or hillock, or a high platform may be built of bamboos or wood and watch kept therefrom. The watcher will be supplied with three flags—white, red and black; the first two being hoisted to indicate the fire station and presence of at least one watcher and the third whenever a fire occurs. Each station is also supplied with a drum. When a fire occurs the drum is beaten, and any forest officer or watcher, on hearing it, should immediately hasten to the place of fire, help to extinguish it, and try to catch the offender. When smoke is seen from any station, the watcher must climb up to the platform and make sure of the fire and then fly the black flag between the other flags in the direction of the fire, till it is extinguished. At the same time he must beat the drum till the fire is extinguished. Drums are also kept at the nakas and beaten so that the villagers may immediately turn out to extinguish the fire.

External fire-lines.

157. External fire-lines, where necessary, should follow, as nearly as is convenient, the boundary of the forests and be wide enough to prevent any outside fire from crossing into it. It is better that such lines should be entirely cleared of all tree and shrubby growth, for, if so treated, the grass and herbaceous growth on them dries up earlier than in the stocked forest and thus permits of their being fired in safety at a time when the forest under-growth is still green. These lines should be burnt before there is danger of fire entering the forest from outside.

Internal fire-lines.

158. Internal fire-lines are subsidiary lines cleared from suitable points on the boundary fire-lines, and carried across the forest so as to divide it into convenient blocks. The object of these traces is to localise any fire which may happen to arise. These fire traces should always follow the natural lines available as under :--

- (i) a road with fire trace on one or both sides ;
- (ii) a cart track ;
- (iii) a foot path ;
- (iv) a compartment line or a demarcation line.

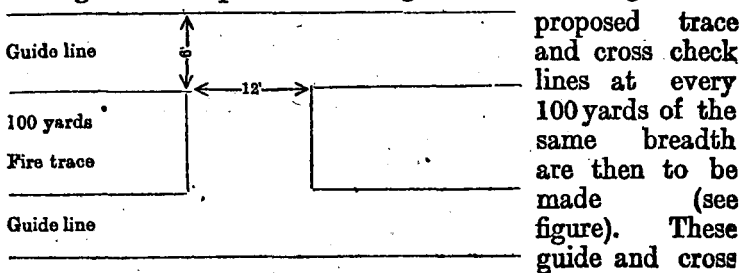
Camping grounds.

159. Each area appointed by the Divisional Forest Officer for halting of carts and travellers should be well cleared and burnt and the trees on the boundary of the area should have a notice affixed for the guidance of all.

Fire-tracing.

160. (i) Fire-traces may be cleared by cutting all the inflammable material on the trace and placing it in the centre of the cleared space and burning it when sufficiently dry and, when the grass is too tall, by cutting all grass and vegetable growth to a certain width (guide lines) on both sides of the fire trace and burning the intervening grass when sufficiently dry. The following is a very useful method of fire tracing :--

(ii) A guide line on either side, of six feet or over according to surrounding growth, is to be thoroughly cleared of all grass and impediment throughout the entire length of the



lines are to be carefully cut and swept; no fire is to be used in their preparation. As soon as they are completed the Beat Officer in charge of the operations should report the fact to the Round Officer and the latter should inspect the same and certify on the diary of the Beat Officer that the guide lines and cross check lines are made properly. At the time of burning the Round Officer must be present. Fire may then be put to the trace.

1	5	2	6	3	7	4
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1, 2, 3 and 4 are alternate sections; also 5, 6, and 7 are alternate sections.

The only precaution that has to be taken after the trace is burnt is that the Round Officer or other official in charge is not to leave the trace until every smouldering piece of wood, etc., left on it is extinguished. The workmen should be supplied with brooms, powras and cutting instruments.

(iii) The width of the fire trace depends on the nature of the ground, the height, density and inflammability of the grass, as well as the nature, size and abundance of fallen leaves, upon the direction and violence of the prevailing winds and upon the value of the forest and character of the stocking. It is found, therefore, to vary from 10 to 100 feet in width.

Time of burning the fire trace.

161. (i) Fire traces should be burnt as soon as the grass on them is sufficiently dry to burn more or less continuously. If the grass, etc., is not sufficiently burnt the first time a second burning should be resorted to by the fire watchers themselves. The portions of the trace where danger from fire is great should be burnt first. Traces should be burnt at night :—

- (a) when there is no dew ;
- (b) when the grass is tall and dry ;
- (c) when it is impossible to approach the fire during the day.

(ii) Traces should be burnt during the day —

- (a) when the dew is so heavy that the grass will not burn at night ;

(b) when there is no dangerous wind ;

(c) when the grass burns with difficulty.

(iii) The time of the night favourable to burning would be 4 p.m. to as far into the night as possible.

Length of the traces to be burnt depends upon :—

(a) the strength of the firing party (but sections over 100 yards are not advisable) ;

(b) the force and direction of the wind ;

(c) the nature and condition of the grass.

(iv) Burning must always be supervised by a reliable subordinate and must not be entrusted to fire watchers alone.

Firing party.

162. The strength of the firing party depends upon the nature of the line to be fire traced. If the line contains much grass the party might consist of :—

(i) two fire-carriers to fire the trace ;

(ii) two side cleaners, whose duty is to go ahead of the fire-carriers and see that the guide and cross lines previously made are effective ;

(iii) two fire conductors to conduct the fire along the guide lines and prevent it from leaving the fire trace ;

(iv) two fire-extinguishers to extinguish patches of grass or dead stumps which remain alight ;

(v) one water carrier to carry drinking water.

163. Once the fire lines have been made it rests with the subordinates to see they are constantly improved.

164. Notices in the prescribed form must be posted at prominent points especially where cart-roads and footpaths enter a fire protected area. Copies of this notice should also be distributed to villagers and Police stations in the vicinity of the reserve.

Extinguishing forest fires.

165. (i) A fire can be extinguished by beating it out with leafy branches of trees. The party should begin from both ends of the fire. It is of no use to try to put it out from one direction only.

(ii) Extensive fires, especially in highly inflammable forests, can be extinguished by counter-firing. For this purpose advantage must be taken of any existing fire line, road, river or nallah in the direction towards which the fire is burning and, failing one of the above, a new line must be quickly prepared at right angles to the direction of the approaching fire. The forest is then fired on the side of the line, etc., facing towards the existing fire, and the two fires advancing towards one another eventually meet and burn out. The coolies who go to put out a fire should be provided with water, a sickle, a small axe, a hand-saw and a spade. One or two men should be left to watch the scene of the fire, and to extinguish any fire that may remain in dry logs, either standing or fallen.

Fire maps.

166. Two maps are necessary.

(i) A map is needed to show the positions of the fire and drum stations, the fire-lines and the camping grounds. Any detailed information regarding class of fire stations, number of watchers or width of lines, etc., can easily be entered in a note in the corner of the map.

(ii) A second map should show the area burnt annually, and this can conveniently be done by shading the burnt portions differently for different years.

(iii) The object of the latter map is to show the badly protected forest at a glance in order that special measures may be taken to protect these areas.

(iv) It is further advisable to enter burnt areas in the working plan control books.

167. In submitting the fire report it must be clearly stated whether the fire :—

(i) originated owing to carelessness in the use of fire by Beat Officers or fire-watchers ;

(ii) crossed from outside ;

(iii) started in a protected area through carelessness ;

(iv) started through incendiarism ; or

(v) started through causes unknown.

168. In addition the following points should be specially reported :—

(i) Date and hour when discovered and by whom.

(ii) Date and hour on which the Beat Officer reached the spot.

(iii) Date and hour when the Round Officer reached the spot with a detailed time table of his movements.

(iv) By whom and at what time the fire was extinguished and the number of villagers from each village that assisted.

2. *Protection from cattle.*

169. Grazing is, generally speaking, disadvantageous to the well-being of forests.

170. The injury resulting from the admission of cattle into the forest consists of:—

- (i) the browsing of the leaves, buds and shoots ;
- (ii) the gnawing and stripping of bark ;
- (iii) the exposure and wounding of the roots by the heavy hoofs ;
- (iv) the forcible bending over or breaking of young growth and even saplings ;
- (v) the dislodging of the soil on steep slopes ;
- (vi) the stamping down of heavy soils ;
- (vii) the destruction of boundary marks, fences and drains.

171. Injuries due to the grazing depend also on (1) the kind of animal grazed, (2) the duration of grazing, (3) the age and condition of the growing stock.

(1) *Kind of animals grazed.*—Browsers, camels and goats are especially destructive to forest growth.

(2) *Duration of grazing.*—The longer grazing is allowed, the greater will be the damage especially when the animals live within the forest. If fire occurs in a forest, grazing therein should be stopped immediately.

(3) *Age and condition of the growing stock*—Grazing in the middle-aged forests is not so injurious as that in young and old forests, because the evil effects due to trampling can be remedied before the forest has to be regenerated. In a young forest the foliage is within the reach of the cattle and is either browsed or trampled. In an old forest the soil is rendered unfit for the germination of seed owing to trampling.

Preventive measures.

172. (i) If cattle are numerous, the population will also probably be numerous and there will, therefore, be

a demand for forest produce. Such demand admits of the introduction of a working plan which latter should make provision for a period of at least ten years' strict closure to grazing, immediately following the exploitation of any coupe or compartment. Should the local forest guard have a large beat or many duties to perform, it may be necessary in some cases to entertain a special watcher to assist in excluding cattle, especially where the forest is exceptionally valuable. Cattle must not be allowed to rove unattended in open forest, but should be accompanied by a herdsman with grazing passes. Trespassing cattle should be impounded or, if they are wild, followed up to ascertain the owners, who in either case should be given the option of paying compensation or of being prosecuted.

(ii) Goats, sheep, camels and elephants, owing to the great damage they commit, should be rigidly excluded from reserved forest or, when this is impracticable, only admitted in small numbers, usually in some proportion to the number of horned cattle.

(iii) Where cattle trespass is rife the grazing fees should be enhanced until the people control their animals. Every encouragement should be given to the local villagers to utilize, by cutting, all available fodder from closed areas. If arrangements are made on these lines the cattle will generally have ample grazing ground in the forests while inflicting the least injury, and those areas where closure is essential for regeneration will supply a large quantity of fodder.

3. *General protection.*

(a) *Offences under the Forest Act.*

173. Unless especially permitted under the forest privilege code of each district commission of any acts under the following sections of the Indian Forest Act and Rules under the Act without license or permit is a forest offence and should be reported :—

(i) *In a reserved forest—*

*Section 25 (a)—*Making any fresh clearing prohibited by section 5;

Section 25 (b)—Kindling or leaving burning fire on roads in reserved forest except at such spots as may be notified by the Divisional Officer ; making ash manure within 200 yards of such forest without due precautions ; and kindling fire within same distance for other purposes ;

Section 25 (c)—Kindling, keeping or carrying any fire except at such seasons as the forest officer may from time to time notify in this behalf ;

Section 25 (d)—Trespassing or pasturing cattle, or permitting cattle to trespass ;

Section 25 (e)—Causing any damage by negligence in felling any tree or cutting or dragging any timber.

Section 25 (f)—Felling, girdling, lopping, tapping or burning any tree or stripping off the bark or leaves from, or otherwise damaging, the same ;

Section 25 (g)—Quarrying stone, burning lime or charcoal or collecting, subjecting to any manufacturing process or removing any forest produce ;

Section 25 (h)—Clearing or breaking up any land for cultivation or any other purpose ;

Section 25 (i)—Killing or catching elephants, hunting, shooting, fishing, poisoning water or setting traps or snares in contravention of rules published in Government notifications Nos. 5627, dated 18th August 1903, 4177 dated 17th April 1916, 5296 dated 12th May 1915, and 9933 dated 16th October 1916.

(ii) *Section 41, Rule 3*—Removal of forest produce, except within the limits of a reserved or protected forest, without a pass from officer empowered or some person authorized, under rule 13 by a Conservator of forests, to issue it ;

Section 41, Rule 19—Closing or obstructing the channel or any portion of the bank of any river lawfully used for the transit of forest produce ;

Section 41, Rule 21—Erection of saw pits, or any machinery or other plant for cutting, converting or fashioning timber or manufacture of charcoal within the limits of reserved or protected forest and within one mile beyond such limits without the previous sanction of a forest officer not lower in rank than a Range Forest Officer ;

Section 41, Rule 22—Moving of private timber from any district of the Presidency without being applied to it a distinguishable private property mark which has been registered in the office of the Conservator or Divisional Officer ;

Section 41, Rule 24—Using private property marks similar to those used by the Forest Department and altering or effacing any Government transit mark ;

(iii) *Section 51, Rule 1*—Failure to report to the nearest forest officer about drift and stranded timber bearing mark not registered under section 41 or on which the marks have been obliterated, altered or defaced ;

Section 51, Rule 5—Marking of drift and stranded timber unless authorized by the Conservator of Forests or having in possession any hammer for marking such timber.

(iv) *Section 69*—Cattle trespassing in a reserved forest or in any portion of a protected forest which has been lawfully closed to grazing.

(v) *Section 78*—Failure on the part of persons who exercise any right in a reserved or protected forest or have been permitted to take any forest produce from or pasture cattle in such forest—

(a) to extinguish any forest fire in such forest of which he has knowledge or information ;

(b) to prevent by any lawful means in his power, any fire in the vicinity of such forest from spreading to such forest ;

(c) to furnish without unnecessary delay to the nearest forest officer or police officer any information about such fire ;

(d) to assist any forest officer or police officer demanding his aid in preventing the commission in such forest of any forest offence or in discovering and arresting an offender.

174. Immediately on discovering a forest offence—

(i) a report in the prescribed form should be submitted ;

(ii) when trees have been cut or stolen the stumps should be marked ;

(iii) when the offender is caught he should be at once taken before the police patil together with *corpus delicti* and a receipt taken for the latter after putting a mark thereon ; full details of timber etc. seized should be given in the enquiry report ; in no circumstances should the seizure mark be placed on parts of a house, standing trees or other immoveable property.

175. The following procedure should be followed regarding registration of offences :—

First Report.

(1) Every forest guard shall keep a "First Report Book," which will be printed in triplicate, and immediately on an offence coming to his knowledge shall fill up or cause to be filled up a form of "First Report" the triplicate copy of which he shall despatch or take to the officer of his round and despatch the duplicate copy to the Divisional Forest Officer direct.

(2) If the knowledge of an offence is obtained from the report of an informer, the forest guard shall proceed at once to the place and after verifying the report shall make his "First Report" without delay.

(3) If the Forest guard cannot write and can obtain no one to write his report, he shall at once go to his Round Officer and have the report written by him from his own verbal report.

(4) A guard is personally responsible for the writing and despatch of the First Report. The counterfoil is his voucher for the report having been made.

(5) A guard shall always carry his First Report Book on his person and produce it for inspection on demand by any Government official.

Note.—Rules 1 to 5 should be separately printed as slips and pasted on the cover of the First Report Book.

(6) This procedure is laid down especially for forest guards, who ordinarily are the first discoverers of an offence, but shall also be applicable to any forest officer discovering an offence.

(7) The first report shall, on no account, be enclosed in a packet with other papers, and the envelope containing it shall be distinctly marked—"First Report."

Enquiry Register and Report.

(8) Every Round Officer shall keep an "Enquiry Register" and immediately on receipt of a First Report (rule 1) he shall enter the facts in that register and shall forward the First Report without delay to the headquarters of his range. He shall then at the earliest possible date after receipt of

the First Report proceed to the spot where the offence has been committed and complete his Enquiry Register as provided.

(9) The Round Officer will be held responsible for the fullest possible enquiry being made, including the drawing up of the *Panchnama*, the recording of statements of the witnesses for the prosecution of the accused and of his witnesses. The offender must always be formally asked to cite witnesses, and should he refuse to do so it should be recorded as part of his statement.

(10) At the same time the Enquiry Report is sent to the Range headquarters, a report under section 52, clause 2, Indian Forest Act, shall be submitted to the Magistrate whenever any property has been attached, and a copy of his report shall be attached to the Enquiry Report by the Round Officer.

(11) As soon as the enquiry is complete, the report with its accompanying statements (rules 9 and 10) shall be forwarded to the Range Officer.

(12) No head of the enquiry report shall ever be returned blank; for instance, if no previous warning, conviction or reason for special punishment is known, then a note to that effect must be entered in the report.

(13) No letter or statement of opinion is to accompany the Enquiry Report. Whatever of this nature the Round Officer has to say must be embodied in his statement as a witness for the prosecution and attached to the report.

(14) This procedure is specially laid down for Round Officers who ordinarily carry out enquiries, but it shall also be applicable to any forest officer making enquiry.

Range Offence Register.

(15) The Range Officer (or his clerk should he be absent on tour) shall put the triplicate copy of the First Report received through the Round Officer (rule 8) on a special bill wire.

(16) If the Range Officer is aware of any previous warning or conviction or reason for special punishment which

has not been recorded by the Round Officer, he shall enter the same in the Enquiry Report over his signature. No addition or alteration may on any excuse be made in the Enquiry Report.

(17) If, in the opinion of the Range Officer, the enquiry is complete, he shall forward the enquiry report and its accompaniments to the Divisional Officer without delay, after noting the precis of the same in the First Report placed on bill wire.

(18) When the Divisional order and the final disposal (rule 25) have been entered in it, the First Report will be removed and placed in a file which will serve the purpose of a Range Offence Register.

Further Enquiry Report.

(19) If, however, the Range Officer thinks further enquiry is required, he shall on no excuse return the papers to the Round Officer, but shall himself proceed, with the least possible delay, to make such further enquiry and record the result in a "Further Enquiry Report" as provided and forward the "Enquiry Report" together with his further enquiry report to the Divisional Officer for orders.

Final Report.

(20) When the whole case is returned to him with orders by the Divisional Officer the Range Officer shall note the order on the First Report (rule 18) and send the enquiry report to the Round Officer for carrying out the orders. On receiving it back from the Round Officer he shall note the final disposal on the First Report (rule 18) and send the whole case to the Divisional Officer with his "final report" in the form provided.

(21) When the case is prosecuted before a Magistrate the papers in the case may be kept by the Court, but in every case the actual enquiry report should be retained by the Range Officer and attached to his final report together with the judgment certificate.

General.

(22) From the date of the final report it will be the duty of the Range Officer to watch the progress of the enquiry.

Should there be delay in the receipt of the Enquiry Report he should find out the reason; but any reference to this end must be kept entirely distinct from the case, delay in any stage of the proceedings shall be punished departmentally by excluding the subordinate responsible from a share in the reward, and also, if necessary, by direct fine.

(23) When the Range Officer delays the papers in order to make a further enquiry the Divisional Officer will note especially whether such further enquiry was really necessary. If it was, the Round Officer shall be punished; if it was not, the Range Officer shall be punished. Should the Round Officer constantly send in incomplete inquiries, he shall be reduced and warned, and if this has no effect, shall be dismissed.

(24) The maximum periods allowable from stage to stage of each case are:—

- (i) one day between discovery and the first report;
- (ii) fifteen days between the first report and the enquiry report;
- (iii) one month between the Divisional order and the final report.

176. It should be noted that the procedure laid down in the preceding two paragraphs refers exclusively to offences under the Indian Forest Act. It is on no account to be applied to offences under the Indian Penal Code, or any other Act. Any such case which may arise shall immediately on discovery be referred to the Police for enquiry and disposal by the Range Officer, to whom all such cases shall be reported by forest guards. When action is taken under this rule by the Range Officer, he shall immediately report in full detail to the Divisional Officer.

177. A register of offenders will be kept by each Round Officer to show in one place the record of each offender for years past (say ten years) as such information is required to be given by him in each offence case. It should be written in the following manner:—

- (i) according to villages, two spare pages being assigned to each village.

(ii) An index should be given on the opening page showing the name of the village and the number of pages assigned to it.

(iii) The name of the offender should be entered under the village to which he belongs, and the Divisional offence number and year with the distinguishing letter A, B, or D to show whether the case was prosecuted, compounded or let off with warning in the third column 'nature of offence' against him, thus, D.O. 443A-1915-16 and a space of one line should be reserved after the entry of the name of each offender to admit the entries being made in the third column against the man for 10 years.

(iv) If the same man happens to commit more than one offence his name is not to be entered over again but only the D.O. number and year should be added in 3rd column against his original entry.

(v) The name of the offender should be entered in the register only on receipt of the Divisional Officer's order on the case and not before.

(vi) The register is not to be renewed annually but is to be continued for ten years.

(b) Application of the Indian Penal Code to Forest Offences.

178. *I. Offences directly connected with a forest or its produce.*

They are—

- (1) Theft—Indian Penal Code, 378 and 379.
- (2) Criminal misappropriation—Indian Penal Code, 403.
- (3) Criminal breach of trust—Indian Penal Code, 405 and 406.
- (4) Receiving stolen property—Indian Penal Code, 410, 411, 413 and 414.

Note.—Recent possession does not properly give rise to a charge of receiving stolen property but to a charge of theft. *Vide* Baden Powell's Manual, page 316.

- (5) Mischief—Indian Penal Code, 425 to 429.

Note.—Section 427 might be used in grave cases of mischief, such as setting fire to a forest, extensive girdling or other injuries to forest trees, instead of Indian Forest Act, section 25.

(6) Abetment of offences—Indian Penal Code, 108, 109, 111 and 116.

(7) Criminal trespass—Indian Penal Code, 441 and 447.

Note.—Simple trespass can be punished under the Forest Act, section 25 (d).

(8) Attempts to commit an offence—Indian Penal Code, 511.

II. Offences indirectly connected with forest work.

(A) Unlawful assembly—Indian Penal Code, 141.

(B) Omitting to give assistance or information—Indian Penal Code, 176, 177 and 187.

(C) Giving false evidence—Indian Penal Code, 191 and 193.

(D) Concealing an offender—Indian Penal Code, 212.

(c) Prosecution and evidence.

Ordinary rules of evidence.

179. The law on the subject of evidence is somewhat difficult to understand, and it requires not only knowledge of the law, but much common sense and experience, to be able to prepare evidence in connection with forest cases. The following are a few suggestions based on experience:—

180. *Burden of proof.*—It lies on that party which would fail, if no evidence were given on either side. When a person is accused of an offence, if he wants to show that his case comes under some exception of the Indian Forest Act or Penal Code, he must prove his case.

181. *Who may testify.*—Section 118:—

“All persons shall be competent to testify unless the Court considers that they are prevented from understanding the questions put to them, or from giving rational answers to these questions, by tender years, extreme old age, disease, whether of body or mind, or any other cause of the same kind.”

182. *Evidence of minors.*—Children, who are under age and who are 9 or 10 years old, may be sworn and examined.

The whole question is whether that person is able to give in court a rational account of what he has seen. There are some courts that are disposed to attach great weight to the evidence of minors, as it is considered to be generally untainted.

183. *Order of examination of witnesses.*—As soon as a witness is in the box and is sworn, the first thing is *examination-in-chief*, which means examination of the witness by the party that has called him. Then comes a *cross-examination*, *i.e.*, examination by the opposite party, if it is so desired, then re-examination, if the party calling him may desire. The re-examination must be directed to explaining or clearing any matter referred to in cross-examination, and if new matter has to be introduced, the permission of the court must be taken, the adverse party having the right to further cross-examination on the same.

184. *Leading questions.*—It is very important to know what is a '*leading question*', section 141.

(i) Any question suggesting the answer which the person putting it wishes or expects to receive, is called a leading question.

(ii) A leading question cannot be asked in examination-in-chief if the adverse party objects, or in re-examination, without the court's permission. But even in examination-in-chief, the courts shall always allow leading questions as to matters—

1st—which are merely introductory ;

2nd—which are disputed ;

3rd—which, in the opinion of the court, have been already sufficiently proved.

(iii) Leading questions may be always asked in cross-examination (section 143).

(iv) When proceedings have been entrusted to Forest Officers of lower ranks, it is not uncommon to see some pleaders of the adverse party trying to raise some objections to questions put by such officers in their examination-in-chief, on the ground of such questions being *leading*, when they are allowed by law as stated above. Ignorant officers get confused at such objections, and unless the court intervenes, often withdraw the questions, when they ought not to do so. The result is that the chain of questions is broken, and the witness, and very often, the prosecuting officer, get confused. This should be borne in mind and carefully guarded against.

185. The cross-examination is an art, and none but men of experience are masters of it. A few necessary as well as directed questions on relevant matters and on salient points of the case would be quite enough. It requires not only knowledge of law, but a close study of human nature, ways of the world, much tact and experience, to conduct a sound cross-examination.

Questions allowed in cross-examinations.

186. In the cross-examination the following sorts of questions are allowed by law :—

1st—leading questions ;

2nd—to test veracity of witness ;

3rd—to discover who he is, and what his position is in life ;

4th—to shake his credit by injuring his character (section 146).

187. *Hostile witnesses.*—Under certain circumstances a party may cross-examine his own witness, but this can be done only by permission of the court.

Before such permission can be granted, the party must show clearly that the attitude of the witness is hostile to the interest of the party. The party must commence questioning him, and must show clearly from the replies that the witness is determined to give hostile replies (section 154).

188. *Some suggestions regarding evidence.*—This paragraph contains certain hints as to the collection and preparation of evidence, which forest officers may read with advantage.

(i) The amount of evidence required in a case is an important question for consideration.

(ii) The British law presumes that every man is innocent until the contrary is proved. It is an established rule that moral conviction alone is not sufficient to convict a man. The evidence ought to be *conclusive*, and it must go to clearly prove the offence beyond all reasonable doubt and bring the case under the wording of the Forest Act or the Indian Penal Code. The following rules, based on experience, may be borne in mind in preparing evidence :—

1. The evidence must be relevant, i.e. it must be admissible according to the provisions of the Evidence Act.

2. It must not be unnatural or unusual or impossible. By 'unnatural' evidence is meant 'got up or fabricated'. Many people seem to labour under an erroneous impression that forest officers fabricate evidence, and that it is their duty to do so, as they want a conviction. This, however, is not true, as justice and not conviction is the aim.

3. The evidence must be direct. If it refers to a thing which could be seen, it must be the evidence of one who has seen it. If it is a thing which could be heard, it must be evidence of one who has heard it. If it refers to a document, and the same is in existence, it must be the document itself, though secondary evidence of it is allowed to be given, by law, under certain circumstances. In all cases direct evidence is the best and likely to be conclusive. Indirect evidence should be given only when it is impossible to give direct evidence.

4. It must not be such as to prove any thing more than is necessary. No attempt should be made to pile up evidence. It is ruinous to the case. •

5. In selecting witnesses, where possible, respectable men only should be brought to depose to the facts. Persons of bad character can carry no weight, and their testimony, even when true, is sure to be viewed with some amount of suspicion.

6. It must be well arranged, in proper sequence of events. Every experienced Forest Officer knows that unless arranged in the order of events the best evidence is or may be confounding, and will probably fail. It is not enough if the investigating forest officer has understood his case.

7. Intricacies should always be avoided, if possible, as otherwise the adverse party has plenty of opportunities to raise contradictions and confusions. The witnesses soon get confused under such circumstances, their testimony becomes unworthy of credit and the case may fail.

8. Never commit the mistake of imparting falsities in evidence, or giving colour to them. If the cross-examination counsel is a clever man, and knows his duty, falsity must come out. In producing evidence, if there is anything found wanting, do not try to make up the deficiency by supplying false facts and making up the chain. It would be much more advisable to leave the case as it is. Even if the evidence is found to be partially coloured the whole will probably be distrusted.

9. Generally speaking, hearsay evidence is not admissible though, under certain circumstances, it may be received. Hear-

say is no evidence, and will not influence the court favourably or go to prove the case.

10. Experience has shown that many forest officers commit the mistake of being content with confessions, and rely upon them for a conviction. It is however an open secret that in nine cases out of ten any confession made in the beginning, no matter when, is almost invariably withdrawn at the trial of an accused, and it would be advisable, therefore, to obtain evidence, just as if no confession had ever been made.

(d) Powers.

189. The powers of the subordinate forest officers under the Indian Forest Act and other Acts are as follows :—

Section.	Nature of power.	Limitations and restrictions, if any.
(I) RANGERS.		
1. <i>Indian Forest Act.</i>		
52A	To release property seized under section 52 on the execution of a bond for its production before the trying Magistrate.	
63A	To release on a bond a person arrested.	
71c	To issue a search warrant under the Criminal Procedure Code.	When conferred by name on selected Rangers (for names of Rangers invested with this power see Government Notification No. 5257 of 11th May 1915).
55	To take charge and dispose of any Government or confiscated forest produce on conclusion of trial of the forest offence committed in respect of it.	
56	To take charge of any forest produce in respect of which an offence has been committed and the offender is not known or cannot be found and which in consequence has been confiscated under the Magistrate's order.	
(II) RANGERS, FORESTERS AND GUARDS.		
41 (rule 14)	To stop and examine timber or other forest produce in transit, when there is reasonable ground for suspicion that any forest	

Section.	Nature of power.	Limitations and restrictions, if any.
	<i>1. Indian Forest Act—continued.</i>	
	offence has been committed in respect thereof.	
44	To demand aid from persons employed at a depot in case of accidents.	
45	To collect drift wood or timber of the description laid down in Article 45 and to notify depots for the reception of such timber.	
52	To seize any forest produce in respect of which there is reason to believe that a forest offence has been committed.	
63	To arrest without orders from a Magistrate and without a warrant any person suspected of being concerned in any forest offence, punishable with imprisonment for one month or upwards.	
64	To prevent or interfere for the purpose of preventing the commission of any forest offence.	
69	To seize and impound cattle trespassing in a reserved forest or any portion of a protected forest lawfully closed to grazing.	
78	To demand assistance from persons bound to render it in— (a) extinguishing forest fire; (b) preventing any fire spreading to forest; (c) preventing the commission of any forest offence; (d) discovering and arresting the offender.	
	<i>2. Indian Arms Act.</i>	
3	To disarm persons going armed without a license or in contravention of the provisions of the Act.	
	<p><i>Note.</i>—(i) Arms supplied by Government to forest subordinates for the protection in the execution of their duties do not require license.</p> <p>(ii) For fire-arms other than those supplied by Government a license is necessary except when the officer is a title-</p>	

Section.	Nature of power.	Limitations and restrictions, if any.
	<p>2. <i>Indian Arms Act</i>—continued.</p> <p>holder or is otherwise exempted. To officers in receipt of more than Rs. 100 per month licenses are ordinarily issued on application and without previous enquiry.</p> <p>(iii) Officers of Government should not dispose of arms and ammunition to any person without making sure that such person is lawfully entitled to purchase or possess the same.</p> <p>(III) FOREST OFFICERS EMPOWERED UNDER RULE 3 OR PERSONS AUTHORIZED UNDER RULE 13 OF THE RULES UNDER SECTION 41 OF THE FOREST ACT.</p> <p><i>Indian Sea Customs Act (VIII of 1878).</i></p>	
157(c)	To issue passes for shipment of forest produce mentioned in Article 176.	
	<p>(IV) RANGERS AND FORESTERS.</p> <p><i>The Bombay Akbari Act (V of 1878).</i></p>	
36	1. To enter and inspect places of manufacture and sale and to enter, seize and arrest, on information that liquor, etc., is unlawfully kept in any enclosed place.	
37	2. To seize liquor, etc., in open places, during transit and to detain, search and arrest persons against whom there is reasonable suspicion.	
	<p><i>The Bombay Salt Act (II of 1890).</i></p> <p>39 3. To (1) enter any place where illicit manufacture of salt is suspected to be going on, (2) take possession of or destroy salt illicitly manufactured, (3) enter and inspect salt works and stores or vessels taken with salt, (4) detain and search any person or animals, etc., for contraband salt, (5) seize contraband salt and (6) detain, search and arrest any offender against the Act.</p>	

Section.	Nature of power.	Limitations and restrictions, if any.
	<p style="text-align: center;"><i>2. Indian Arms Act—continued.</i></p> <p style="text-align: center;">(v) FOREST GUARDS.</p> <p style="text-align: center;"><i>Abkari Act V of 1878.</i></p> <p>57. To seize liquor, etc. in open places, during transit and to detain, search and arrest persons against whom there is reasonable suspicion.</p> <p style="text-align: center;">(vi) RANGE FOREST OFFICERS.</p> <p style="text-align: center;"><i>Indian Forest Act, 25 (b), rule 3.</i></p> <p style="text-align: center;">(a) General.</p> <p>1. To grant permission to kindle fire within 200 yards from the boundary of a reserved forest.</p> <p>41 (rule 21) 2. To sanction the establishment of a saw-pit, erection of any machinery or plant for cutting, converting or fashioning of timber, or manufacture of charcoal within or within one mile beyond the limits of any reserved or protected forests.</p> <p style="text-align: center;">RANGE FOREST OFFICERS IN KANARA.</p> <p style="text-align: center;">(b) Special.</p> <p>56 (rule 1(f)) 1. To grant permit for removal of forest produce up to the value of Rs. 50 on payment at scheduled rates.</p> <p style="text-align: center;">RANGE FOREST OFFICER, AKRANI, NORTH KHANDESH DIVISION.</p> <p>Land Revenue Code. 2. Powers of Mahalkari in the Akrani Mahal, West Khandesh District.</p> <p style="text-align: center;">RANGE FOREST OFFICER, KALGHATGI, KANARA NORTHERN DIVISION.</p> <p>3. Powers of a Mahalkari in the Devikop Mahal, Dharwar District.</p> <p style="text-align: center;">RANGE FOREST OFFICER, VIRNOLI, KANARA NORTHERN DIVISION.</p> <p>4. Powers of a Mahalkari in the Virnoli Mahal, Kanara District.</p>	<p>Provided that the produce is not obtainable under the Kanara Forest Privilege Rules and subject to the other conditions in rule 1.</p>

Section.	Nature of power.	Limitations and restrictions, if any.
	<i>2. Indian Arms Act—continued.</i>	
	RANGE FOREST OFFICER, KULGI, KANARA NORTHERN DIVISION.	
Land Revenue Code.	5. Powers of a Mahalkari in the Kulgi Mahal, Kanara District.	
	RANGE FOREST OFFICER, DANDELI, KANARA NORTHERN DIVISION.	
"	6. Powers of a Mahalkari in the Dandeli Mahal, Kanara District.	
	RANGE FOREST OFFICER, BHART- NAHALLI, KANARA EASTERN DIVISION.	
"	7. Powers of a Mahalkari in the Bilki Mahal, Kanara District.	
	RANGE FOREST OFFICER, KIRWATTI, KANARA EASTERN DIVISION.	
"	8. Powers of a Mahalkari in the Kirwatti Mahal, Kanara District.	
"	9. Do. in the Kargod Mahal, Dharwar District.	
	RANGE FOREST OFFICER, BELGAUM, BELGAUM DIVISION.	
"	10. Powers of a Mahalkari in the Belgaum Mahal, Belgaum District.	
	RANGE FOREST OFFICER, KHANAPUR, BELGAUM DIVISION.	
"	11. Powers of a Mahalkari in the Khanapur Mahal, Belgaum District.	
	RANGE FOREST OFFICERS, SHIRPUR EAST, SHIRPUR WEST, SHAHADA AND TALODA IN THE NORTH KHANDESH DIVISION.	
Indian Land Improvement Loans Act (XIX of 1883) and Agriculturists' Loans Act (XII of 1884).	12. Powers of a Mahalkari in respect of the two Acts for forest settlements.	

(e) Special obligations.

190. Special obligations of Forest Officers are :—

In order that Forest Officers may devote all their time and energy to work and in order to protect them from suspicion that they derive personal benefits from the work carried on under their supervision, they are forbidden—

(a) Indian Forest Act, section 74.

(i) to trade ;

An offence under this section is punishable with simple imprisonment up to one year or with fine or with both—Indian Penal Code, 168.

(ii) to hold land ;

It is necessary to furnish information to the Conservator regarding any property owned by a Forest officer. The Conservator may pass such orders as may be necessary.

(iii) to take part in any contract for working any forest ;

(b) Indian Forest Act, section 61,
from vexatiously and unnecessarily

(i) delaying the transit of any forest produce which is lawfully in transit ; and

(ii) unloading any such produce or causing the same to be unloaded (proviso to rule 14 of the rules under section 41) ;

(iii) seizing or causing to be seized through a Police officer any property (Indian Forest Act, 52) ;

(iv) seizing and impounding cattle (Indian Forest Act, 69) ;

(v) issuing search warrant (when power is delegated under section 71, Indian Forest Act) with a view of wilfully causing loss to any person under the semblance of the authority conferred by the Act ;

- (c) Indian Penal Code, section 119,
from concealing the existence of a design to
commit an offence ;
- (d) Indian Penal Code, section 116,
from abetting an offence ;
- (e) Indian Penal Code, section 161,
from accepting illegal gratifications.

CHAPTER VII.

ACCOUNTS.

1. *Collection of Revenue.*

191. Except Range Officers and officers empowered in writing by the Divisional Officer no subordinate may receive money on behalf of Government.

192. Every forest subordinate whether appointed permanently or temporarily whose duty requires that he should be entrusted with the charge of Government money shall furnish security for a sum equivalent to one year's pay or the amount of forest revenue or funds which such subordinate is by special authority from the Conservator permitted to hold at any one time in his custody.

193. Permits, passes or licenses, which any officer is authorized by the Divisional Officer to issue, must at once be issued on payment.

194. Under no circumstances shall manuscript permits, passes or receipts be issued.

195. Receipts in the prescribed form must always be immediately given for any Government money collected.

196. Every item of revenue must be supported by due voucher, viz., receipt in form No. 14 or permit in form No. 15 or 15A.

197. Forest subordinates shall not accept ready money payment when it can be avoided as in the case of coupe and farm contractors and village officers collecting forest revenue, but shall furnish the party tendering the amount with a chalan in duplicate and direct him to pay the money direct

into the Treasury and return the duplicate chalan signed by the Treasury Officer as a voucher. Where there is not a Treasury but a local Post Office they must prepare a money order form made payable to the Treasury Officer and hand it over to the person from whom revenue is due for payment through the Post Office. The money order receipt presented by the party will be the voucher.

198. No forest subordinate shall, in any case,

(i) keep in his custody any item of forest revenue for more than one month after its receipt by him, or

(ii) allow a larger sum of revenue than the amount of his security to accumulate or remain in his charge, but shall remit it at once to the Treasury.

199. Small sums such as permit fees, etc., may be received in a range, round or depôt office, but the total sum accumulating in a day should be remitted to the Treasury on the same day when the Range office is situated at a Treasury place or when it is situated at a distance in the manner laid down in section 197 above.

200. The Range Officer shall keep a strict control over the actions of his clerk and always see that all money transactions are properly and promptly brought on to the Cash book, remembering that the responsibility of such transactions rests entirely on him.

2. *Disbursement of Government money.*

201. The amount of advances to be made to any forest subordinate should not as a rule exceed the amount of his security, but should it be found absolutely necessary on any special occasion to advance more funds the fact should be reported to the Conservator.

202. Every Range Officer shall make all payments himself and never entrust them to his clerk, except that where delay would otherwise occur, petty sums of less than Rs. 20 in any one instance may be paid through him or through a beat officer. In such cases the Range Officer is responsible that the money has been truly disbursed and the signature correctly taken and must satisfy himself to this effect.

203. The practice of Range Officer's giving petty advances to workmen, even though it be on his own responsibility, should be stopped as far as possible. When important works involving large payments such as fellings, fire tracing, making roads, demarkating boundary lines and the like are undertaken departmentally the Range Officer should, at least once in each week, arrange to pay the amount direct or through the Round Officer. The money must be taken straight to where the work is going on and paid off within 24 hours of its arrival. If the coolies are in want of money more often than a week the official in charge may make disbursements twice a week. But every payment so made must appear in the Range Office accounts at once supported by a completed muster roll.

204. Every item of payment must be supported by due voucher in any one of the forms Nos. 27A (acquittance roll), 29 (travelling allowance bill), 31A (muster roll) or 32 to 32D (other vouchers).

205. Payees and subordinates should not be called into head-quarters to receive pay due. Payments must be disbursed promptly on the spot.

206. The following rules for the preparations of vouchers should be observed :—

(i) All sums disbursed should be shown on the voucher in words as well as figures.

(ii) The signature of the payee must be written on the voucher or if he is illiterate the impression of his left thumb must be affixed.

Note.—The thumb impressions taken on a voucher should be clear and attested with the endorsement 'before me' by the disbursing officer.

Impressions should be taken in the following manner :—

A small quantity of ordinary printer's ink (which will be supplied by the Superintendent of Stationery) mixed with a small quantity of sweet oil, should be well rubbed with an Indian rubber roller on a tin slab until a very thin even layer is formed. The ball of the thumb of the left hand of the payee after being wiped should be laid on

the inked slab and rolled from side to side (not rubbed) until sufficiently inked (this can be learnt from experience) and then lightly and carefully rolled on the paper on which the print is to be taken in such a way that the pattern of the whole of the ball of the thumb from side to side is clearly impressed on it. It must be specially borne in mind that any side movement, either at the time of applying or removing the thumb, will cause a smudge and spoil the impression.

(iii) If a stamp is used the signature must be partly on the stamp and partly on the paper. Signed stamps may not be affixed.

(iv) Payees should note the date of payments below their signatures. If they are too illiterate to do so, the disburser will note the date of payment in the prescribed place on the voucher.

(v) Under no circumstances may a voucher be signed except at the time of disbursement. No one may sign on another's behalf and disbursers will be held personally responsible that signatures taken by them are genuine.

(vi) All vouchers must be written in the vernacular of the district unless the payee understands English.

(vii) Vouchers for payment, other than advances to disbursers, of over Rs. 20 should be stamped with a one anna stamp.

(viii) All corrections in a voucher should be made in red ink and attested.

Form No. 27A.—Acquittance rolls.

207. The Range and Round Officers should disburse the pay of their establishments on duplicate acquittance rolls, and send the originals with their monthly cash accounts as vouchers and keep the duplicate as office copies. In cases where arrear pay becomes due, they should prepare supplementary rolls from the office copies. In either case rolls need not be sent for pre-audit unless the claims are older than a year. The files of the office copies will serve the pur-

pose of the establishment pay bill registers in Range and Round Offices.

The following instructions should be followed in preparing the rolls :—

(i) In the case of a subordinate on leave his name and pay should be shown in red ink with a remark in the column 'signature,' stating the kind and extent of, and the authority granting, the leave.

(ii) When a fine is inflicted, the amount and the authority inflicting it should be stated in the column 'signature' against the individual and the pay minus the amount of such fine shown in the column 'amount.'

(iii) Amounts of dress-fund, provident fund and income-tax must also be shown separately in the column 'signature' against the individual concerned, but should not be deducted from the pay shown in the column 'amount,' although the pay may be actually disbursed less by such amount.

(iv) Amounts of recoveries of advances of pay or conveyance allowance will be dealt with in the same way as the fund deductions mentioned in clause (iii) above.

(v) In all cases when a permanent first appointment or an acting or temporary appointment is made, the authority under which the appointment was made should always be quoted in the last column against the name of the man appointed.

(vi) The pay must be invariably disbursed by the 12th of the month in which it becomes due.

Form No. 29.—Travelling allowance bill.

208. Subordinates should submit their claims in their diary to the Divisional Officer by the 10th of the month following that to which the claim appertains. Claims preferred later without satisfactory grounds will be disallowed.

Form No. 31A.—Muster rolls.

209. The following instructions should be observed in keeping the muster rolls :—

(i) In the heading the work for which the labourers are employed should be specified clearly.

(ii) The roll should be called every day without fail before commencing and after closing the work and the daily total of presence stated in it and attested.

(iii) The Range Officer should make surprise inspection of these rolls and endorse on them 'checked with the labourers present and the work done and found correct'.

(iv) When the roll is closed, an abstract of the whole work should be given at the end thus :—

. Under AII.—The length of boundary line of coupes or compartments demarkated and number of standards marked should be stated. Also when cattle are impounded their number and whether from closed or open forest must be stated.

Under AVIIIa.—Demarkation, the length and width of the line demarkated should be stated differentiating between external and internal boundaries as also the method employed such as by cairns or pillars, etc., with their sizes.

Under AVIIIe.—The area of beds prepared, the quantity and kinds of seeds sown, or the number and kind of seedlings trasplanted should be stated.

Under AVIIIf.—The name and number of block and compartment, number and length of line and rate of wages should be stated.

Under AVIIIg.—The number of creepers and useless trees cut and other kinds of cultural operations carried out should be stated.

(v) Payments on muster rolls should be made or witnessed by the officer of highest standing available, and he should certify to the payments individually or by groups by a distinctive mark, his initial or signature. The amount paid on each date should be noted in words as well as in figures at the foot of the muster roll.

Form No. 32.—General vouchers.

210. The following instructions should be followed in the preparation of these vouchers :—

(i) Vouchers should ordinarily be in the prescribed form.

(ii) Such forms should not be attached by Range and Round Officers to—

(a) receipts taken on blank paper when the forms are not available,

(b) receipts obtained for payment for money order commission, toll and the like, for which the Post Office Toll and other departments have their own forms; and

(c) receipts issued by the Treasury Officers for the value paid for service postage stamps.

(iii) The disbursement certificate should be written by Range and Round Officers under the original receipts.

(iv) Whole sheet voucher forms should not be used when half sheet ones suffice.

(v) No duplicates of vouchers should be taken or kept in the Range or Round Office.

3. *Power of confirming and procedure for conducting sales.*

211. The following rules should be observed :—

(i) Where the sale price is estimated to exceed Rs. 5 up to the limit of Rs. 50 a copy of the 'notice of sale' in the prescribed form with a report showing the reserve price based on the results of similar previous sales should be submitted by the Range Officer to the Divisional Officer in ample time to admit of his decision being communicated before the date of sale. Subject to this decision the sale to be confirmed by the Range Officer.

(ii) Sales estimated to produce less than Rs. 5 each to be confirmed by the Range Officer. The result to be reported to the Divisional Officer for information.

(iii) A Range Officer may allow a Round Officer to confirm sales up to Rs. 5 provided he fixes the reserve price.

(iv) Bills in form No. 13 must be prepared for sales held.

(v) The result of every sale held by a Range Officer or a Round Officer shall be reported at once to the Divisional Officer.

(vi) These rules apply equally to sales of forest produce, piece work, etc.

(vii) The reserve price is merely an estimate of the price which the officer authorized to sell expects to get. When this has been accepted by the Divisional Officer the selling officer is at liberty to accept it or any rate he may, it being understood that he will do his best to get as much more as possible. The fixing and acceptance of this price should on no account be made public.

(viii) Notices of sale should usually be issued to the public 15 days prior to sale.

(ix) It should be notified at the time of each sale that no private offers shall be considered after the sale and the selling officer should strictly keep to that.

(x) When a sale is not confirmed a fresh notice should issue at once.

(xi) Any suspicion of abuse on the part of the selling officer will lead to withdrawal of the above powers and the severest punishment.

(xii) At sales no offer is to be confirmed without taking $\frac{1}{4}$ of the bid and when below Rs. 10 the whole sum with an endorsement that the same will be forfeited in case of non-fulfilment of the sale terms.

(xiii) In cases where sales are held subject to the confirmation of the Divisional Officer bids must be accompanied by an endorsement that the bidder clearly understands that the bid may be rejected or accepted within 30 days after which it will be no longer binding, but that, within this period, he is bound to

complete the sale if called upon to do so and, failing in this, his deposit will be forfeited.

(xiv) The selling officer is responsible that offer for confirmation is submitted in time for return within the stipulated period to the Divisional Officer.

(xv) The maximum amount up to which a Range Officer or Round Officer may confirm a sale refers to the aggregate sum of the sales they hold in one place on one occasion.

4. *Custody of Government money.*

212. Government money in headquarters will be kept in the cash chest provided for the purpose. This chest must be securely chained to a post in the house. When on tour money will be kept in a strong box provided for the purpose with the padlock and chain. This box must be secured at night beside the officer responsible for its safe custody. When the officer responsible is absent during the day, time his clerk or peon should be made responsible for looking after it.

213. Every effort should be made to keep down the cash balance by prompt disbursements, and more money than required should not be asked for. An explanation should be submitted with the accounts when the cash balance exceeds the amount prescribed by the Divisional Officer.

214. The keys of the cash chest should never be out of the possession of the disburser. At night they should be kept under his pillow or tied to his belt. Under no circumstances may keys be handed over to any one.

215. The actual cash balance should be counted each time the cash book is closed. If any excess or deficit is found a note will be at once made in the cash book and a report forwarded explaining the discrepancy.

216. Under no circumstances may money or valuables, that are not the property of Government, be placed in the Government cash chest or cash box.

5. *Cash book.*

217. Every subordinate who is authorized to receive and disburse Government money must maintain a cash book in which he will enter all money transactions immediately they occur.

218. Every item of revenue and expenditure must be supported by due voucher (*vide* paragraphs 196 and 204).

219. Full particulars of transactions must be shown in the cash book as well as in the vouchers concerned.

220. Corrections must be made by drawing a red ink line through the entry and writing the correction on the top. When one or more figures of a sum or number require correction the whole sum or number must be re-written. All corrections must be initialled. No erasures with a knife or otherwise may be made.

221. All advances recovered or paid should be entered in red ink.

222. Revenue collected locally may be used for local expenditure only under the express orders of the Divisional Officer. If on the date of closing accounts any sum of revenue remains in a disbursers hands, which he is unable to remit to treasury he may treat the unremitted revenue as Forest Advance for expenses during the fresh month submitting a voucher for the amount with the cash account. Nothing in the above is to be taken as allowing large sums to be kept unremitted. In no case may revenue in excess of the amount sanctioned by the Divisional Officer be retained unremitted.

223. The Range Officer will collect all revenue pertaining to his range as a whole, such as value of coupes or compartments sold standing, of hardas, honey, etc., farms, fees on timber permits and such other major items and disburse the pay of his own office and expenditure on original works, special repairs, and sylvicultural, girdling, marking, reservation and felling operations.

224. The Round Officer will collect all petty items of revenue pertaining to his charge such as grazing fees, assessment of forest lands, permit fees on minor forest

produce, compensation, etc., and disburse pay of the establishment under him and expenditure on annually recurring petty works such as fire-tracing, current repairs to roads, buildings, wells, etc.

6. *Cash accounts.*

225. Both the Range and Round Officers will send on the 25th of each month, on which they close their cash book for the month, an application for funds in form No. 20A. In the application they should show the cash balance on hand and the amounts required for expenditure during the following month against the printed heads. One cheque will be issued on the 1st of each month in the name of the Range Officer for the sum required by him as well as the sums required by the Round Officers and sent with a consolidated advance receipt in form No. 32. The Range Officer will cash the cheque by the 5th and distribute the money to all concerned, who ought to attend the Range Office at headquarters that day without fail, and return the advance receipt signed by them for the sums received. The Range Officer will credit in his account only the amount actually retained by him.

226. Every Range, Round and Dépôt Officer should submit on the 26th (or such other date as may be fixed by the Divisional Officer) of each month an abstract in duplicate of their cash book in form No. 25A or B, together with all vouchers, to the Divisional Officer direct. The heads and sub heads of all usual items of receipts and expenditure are printed in this form. The officials keeping this form by their side, shall enter the sums against the heads in it from the cash book as the latter is written up from day to day, and thus have the cash account automatically rendered at the close of the month. The duplicate copy of the abstract will be returned to the officer concerned with orders regarding sums, disallowed, etc., noted in the 'remarks' column. These copies will be filed by the officers and produced at the time of inspection of their offices. Where the Round Officers are not fit, because not sufficiently educated, to render their monthly cash accounts

they shall have their accounts supervised by the Range Officer.

227. The forms Nos. 25A and B, respectively, serve the purposes of monthly cash accounts (form No. 25), classified abstracts of revenue and expenditure (form No. 35), and objection statements (form No. 49).

7. *Inspection of Round cash books by the Range Officer.*

228. The Round cash book is subject to inspection by the Range Officer at least once in three months. He must examine the works executed, see from the works whether the expenditure charged for them in the cash book is in each case appropriate and genuine, and where it is not, report the matter at once to the Divisional Officer.

8. *Range Contractor's and Disbursers' ledger.*

229. This must be kept in Range offices where necessary. The Range Officer, having often to carry out original works or special repairs departmentally, makes advances to piece workers from time to time for the due performance of work on his own responsibility. Such advances should be entered at once in the cash book and the contractors' ledger. The latter, showing their state at a glance, will enable him to effect speedy recovery and prevent over payment. A new Range Officer, while taking over charge must examine the ledger and sign it in token of its correctness and endeavour to recover sums outstanding, if any, either by work done or in cash.

CHAPTER VIII.

OFFICE WORK.

1. *Registers to be maintained.*

230. The registers and books required to be maintained in the different subordinate offices are given in Appendix M.

231. Pass, permit and receipt books are to be kept only by such of the subordinates as have been authorized to keep them by the Divisional Officer.

APPENDIX G.

[Section 142 (2).

Statement of standards broken in coupe Name—
No.of block Name— Range, Division.
No.

during 19 —19 .

Cut or broken standard trees.			Substituted.		Near which number.	Total standard trees broken or cut.	Remarks as to whether the standard was broken through carelessness.
Std. No.	Kind.	Girth.	Kind.	Girth.			

NOTE.—This statement should be filled in from the register of standards as the latter is written up.

APPENDIX H.

[Section 142 (xvi).

No. of

Mr. , contractor, coupe No.

Block No. , is directed under clause 1 (d) of the agreement to entertain a watcher on Rs. 9 a month in the coupe from the date the felling operations are commenced till the coupe is handed back to the Forest Department. The watcher will be under the Range Forest Officer's orders. The pay of the watcher will be disbursed by the Range Forest Officer after recovering it from the contractor. The principal duty of the watcher is to guard the cutting against fires and cattle. He may, in addition to these duties, supervise the contractor's work in the cutting.

Divisional Forest Officer.

245. Outbreaks of human epidemics, as plague, cholera, small-pox, etc., should be reported to the Divisional Officer by Range Officers when such occur in their jurisdictions as should also be animal epidemics, viz., anthrax, surra, rinderpest, foot-and-mouth disease, etc.

246. In the case of cholera epidemics, Range Officers should disinfect forest wells with Potassium Permanganate, a supply of which should be asked for when indenting for medicines.

247. In order that every thing possible may be done to prevent plague, Range Officers are ordered to see that (i) all rats in all Government buildings under their charge, including their own houses, are killed as far as possible, (ii) the buildings are kept as clean as possible, and no old food is left about so that rats may be attracted, (iii) the space between the floor and the ground is kept clean and double walls, etc., are avoided, and (iv) all old boxes and heaps of rubbish are destroyed.

248. Range Officers should always have in their possession sufficient medicines for supply to subordinates and coolies. They must never be without quinine tablets and castor oil and should invariably apply to Divisional Office for a fresh consignment before their supply in hand gives out.

2. *Collection of specimens.*

249. Range Officers must supply themselves with board presses and must always have at least 50 sheets of drying paper.

250. Specimens should be as complete and typical as possible and for each species the following should be collected :—

- (a) A flowering branch, 15 inches long.
- (b) A similar branch with full-sized leaves.
- (c) A similar branch with fruit.

Three sets of each should be collected from one and the same tree.

251. Specimens should be collected on a bright sunny day if possible and placed in the press with a label before

they begin to wither. The object is to dry them as soon as possible and this is best done by changing the drying paper at least twice for 2 or 3 days in succession. Damp paper should be dried in the sun or before a fire before use. It is best to have two or three sheets of drying paper between specimens. The press should be tied up firmly but not pressed so hard as to squeeze the specimens out of shape. On a dry day the press should be exposed to the air as much as possible and on a damp day should be protected from the damp.

252. When dry, the specimens should be removed from the press and placed in double sheets of ordinary newspaper. Labels should say whether the plant is a large or small tree, shrub or climber and should show the locality, elevation and date of collection together with any other special information such as the colour of the flowers.

3. *Collection of seeds.*

253. Fruit should be gathered when ripe from a sound mature tree on a dry day if possible. The biggest seed should be chosen and seed should be tested by cutting or breaking off a few seeds to see whether the kernels are worm-eaten.

254. Seeds should be taken only from ripe fruit, and in the case of pulpy fruit all pulp should be removed and the seed wiped and dried in the sun and packed in a paper packet or canvas bag with a strip of paper enclosed, giving the name of the seed and references to the correspondence. The seed should be despatched as soon after it is dry as possible.

Seeding of important species.

255. The occurrence of a good seed year of any of the more important kinds of trees or bamboos in any range should be reported to the Chief Conservator through proper channels.

4. *Flowering of bamboos.*

256. When bamboos flower the fact must be at once reported. The report should state :—

- (i) Kind of bamboo.
- (ii) Forest in which flowering has taken place.

(iii) Whether the flowering has taken place over large areas by groups, or by single clumps.

257. If the flowering has taken place over large areas a map illustrating the areas flowered over should accompany the report. Signs of flowering, such as failure to produce new shoots, should be carefully looked for and similarly reported.

258. About a pound of sound ripe husked seed of each kind of bamboo that flowers should be collected and sent to the Divisional Office.

5. *Injury by insects.*

259. Any extensive injury to trees by insects should invariably be reported. The report should show locality, and nature of injury and if possible specimens of the insects and of the injured part of the tree should be sent with the report.

260. In particular injury to teak trees by boring insects should be sought for and reported. Such injuries are most likely to be found on trees below 3 feet in girth and are most noticeable during the months May to July.

261. In collecting insect specimens, moths and butterflies should be killed by squeezing them under the wings. They should then be wrapped up separately in paper. Beetles and caterpillars should be killed by dropping into boiling water. They should then be taken out, dried in the sun and wrapped in paper. Every care should be taken in packing specimens to see that they are not injured. Each wrapper should be numbered with a number referred to in the report. In the case of insects living in wood if possible specimens should be submitted alive inside the wood in which they are found.

6. *Eradication of lantana.*

262. When lantana is found to have covered a considerable area the whole mass should be burnt over during two succeeding hot weathers. It is advisable not to cut it before burning because the cutting causes the seed to fall in large quantities and numerous seedlings appear with the rains. In the third hot weather it may be cut and again

burnt. A few weeks after the break of the rains seedlings will appear and these must be pulled up. No pulling up of even the smallest plants must be allowed unless the ground is soft, as if the ground is at all hard the plant will break off near the ground level and at once spring up again. If the ground is not really soft everything must be uprooted and this should be done with a weeding knife, similar to that used by Malis. The seedlings, when uprooted, should be dried in the sun and burnt.

Work to be done each year—

(a) *First hot weather*.—Burn the whole patch.

(b) *Second hot weather*.—Burn the whole patch.

(c) *Third hot weather*.—Cut the whole patch in the cold weather and burn when thoroughly dry in April. As soon as the rains break have all flowering plants and seedlings uprooted.

(d) *Fourth hot weather*.—Finish any cutting and burning that is necessary and uproot all remaining seedlings and roots that show signs of life after the rains break.

(e) *Succeeding seasons*.—Continue the work done in the fourth hot weather until all *lantana* has disappeared. Burning is always necessary. Small seedlings are hardly visible in thick unburnt masses of woods and grass.

APPENDICES.

LIST OF APPENDICES.

Disting- uishing letter.	Subject.	Page.	Reference to Manual Section.
A	Estimate for repairs to roads ..	119	51
B	Estimate for new road ..	120	52
C	Register of timber, etc., used for departmental works ..	122	58 (iv)
D	Standard reservation in strips ..	123	140 (i)
E	Register of standards ..	124	140 (iv)
F	Certificate of handing over charge of coupe to contractor ..	125	142 (ii)
G	Statement of standards broken in coupe ..	126	142 (x)
H	Form of order to contractor for entertaining a watcher in the coupe ..	127	142 (xvi)
I	Form of notice to contractor in case of bad * work in the coupe ..	128	142 (xx)
J	Register of felling of coupe ..	129	142 (xxii)
K	Schedule of classification of timber showing how to calculate its outturn ..	130	142 (xxii)
L	Form of certificate to be sent by Range Forest Officer after examining the coupe ..	131	142 (xxiii)
M	List of books, registers, etc., required to be maintained in the different subordinate offices ..	132	130 and 230

APPENDICES.

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APPENDIX A.

Section 51.

Range.

Estimate for repairs to roads.

Kind of road.	From.	To.	Length.	Nature of repairs.	Estimated cost.	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Miles.		Rs.	

No. dated

Submitted to the Divisional Forest Officer.

Range Officer.

APPENDIX B.

[Section 52.]

Estimate for New Road.

12 feet cart road

Proposed-----

6 feet path

From

To

Range

Division.

Measurement record.

Peg No.	Distance in feet.	Cutting.			Embankment.			To be dug out.		Gradient.		Forward bearing.	Remarks.
		Cross section at peg.	Mean of two sections.	Cubic contents.	Cross section at peg.	Mean of two sections.	Cubic contents.	Trees over 3 feet grth.	Bamboo clumpa.	Rise.	Fall.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		Square ft.	Square ft.		Square ft.	Square ft.							

APPENDIX—*continued.*

When using this form see instructions below.

Instructions.

Columns 1 and 2.—Distance apart of pegs should average one chain or 66 feet. It will be less on hills and more on the flat. Total of the column 2 multiplied by width of road will give area of jungle clearing required. Distance should be shown on a line between the pegs thus :—

Peg 1.

100 feet.

Peg 2.

Columns 3 and 6.—Cross section taken at peg.

Columns 11 and 12.—Maximum gradients allowed are for 12 feet cart road 1 in 15 or 3° 49' for 6 feet path 1 in 7 or 8°.

Column 13.—Need be filled in for cart roads only.

Column 5.—Actual horizontal breadth of cutting on hill sides to be 6 feet for a cart road and 4 feet for a path. Volume estimate of earth work will be calculated accordingly.

Columns 5 and 8.—Totals should be made for each mile of road or path or when total of Column 2 is 5,280 feet approximately. Number of marketable trees of each species will be recorded in a foot note at the close of each mile.

Column 14.—Will record bridges and culverts with required span measurements. Also occurrence of rock and need for blasting.

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APPENDIX C.

Section 58 (iv).

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Register of timber, etc., used departmentally for

(name of work),

Range,

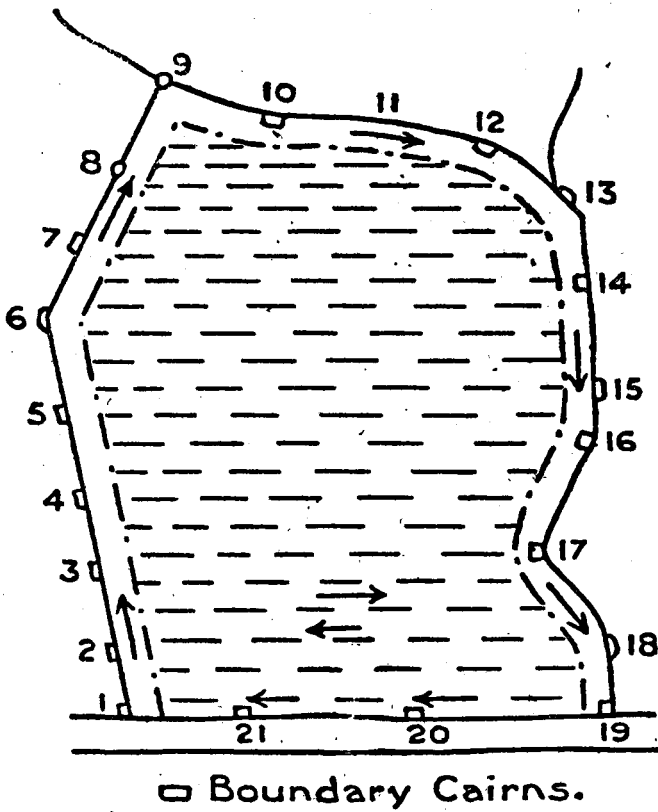
Division.

Particulars of timber taken.				Particulars of material sawn from each log.					Used for work.					On hand at close of work.					
Kind.	Measurement of log.			Description.	No.	Measurement.				No.	Measurement.				No.	Measurement.			
	Length.	Girth.	Cubic feet.			Length.	Breadth.	Width.	Cubic feet.		Length.	Breadth.	Width.	Cubic feet.		Length.	Breadth.	Width.	Cubic feet.

APPENDIX D.

[Section 140 (t).

Standard Reservation in strips.



APPENDIX E.

[Section 140 (iv).

Reservation of Standards.

Village :-

S. No.

Range :-

Block :-

Coupe :-

Place of commencing strip.	No.	Species.	Girth in inches.	Place of ending strip.	Remarks.
Cairn I	1	Teak	25		
	2	"	16		*
	3	Sissam	34		†
	4	"	24		
	5	Shivan	40		
	6	"	29		
	7	Teak	37		
	8	"	25		
	9	"	26		* †
	10	Khair	24		
	11	"	30		
	12	Jamba	32		
	13	"	27		
	14	"	41		
	15				
	16				
	17	&c.			
	18				
	19				
	20				
	21				
	22	Teak	27	Standard No. 2.	
Standard No. 4	23	Babul	38		
	24				
	25				
	26	&c.			
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				
	36				
Do. No. 18	37	Khair	25	Do. No. 17.	
	38	Sissam	31		
	39				
	40				
	41				
	42	&c.			
	43				
	44				
	45				
	46				
	47				
	48				
	49				
	50				

Dated—

* Standard broken.

† Extra stem reserved on numbered trees.

‡ Stem to be felled from the stump of a reserved tree.

Signature and rank of Reserving Officer:—

(Signed at the time of reservation.)

Signature and rank of checking officer.

(Signed at the time of taking charge from contractor.)

APPENDICES.

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APPENDIX F.

[Section 142 (ii).

I, _____, contractor of coupe No. _____ of
block No. _____, Range, _____ Division,
hereby certify that according to clause 1 (c) of the agreement
I have been shown the boundaries of the coupe in the forest
according to the tracing attached to the agreement. I took the coupe
in my charge after getting full information about the boundaries.

Forest Officer giving charge
of the coupe.

Contractor.

APPENDIX I.

[Section 142 (xx).

Notice.

Notice is hereby given to the coupe contractor Mr. _____ of coupe No. _____, block No. _____ of _____ Range, that he has not yet done the work of

in accordance with clause _____ of the agreement, which must be done within _____ days from the receipt of this notice. If he fails to comply within the time allowed the matter will be reported to the Divisional Forest Officer, _____, and steps will be taken as he may direct.

Range Forest Officer.

K D 23-17

APPENDIX J.

[Section 142 (xxii)].

Name
 Register of felling of Coupe of Block No. of Range, Division,
 No.
 during the year 19 -19 .

Contractor's name.	Name and number of coupe.	Area of coupe.		Timber cubic feet.								Fuel cubic feet.			Remarks.		
		Acres cut.	Acres not cut.	Cut and prepared.		Brought to depot.		Brought out of coupe.		In the coupe.		Cut.	Brought to depot.	Brought out of coupe.		In the coupe.	
				Logs or poles.	Cubic feet.	Logs or poles.	Cubic feet.	Logs or poles.	Cubic feet.	Logs or poles.	Cubic feet.						

APPENDICES.

APPENDIX K.

[Section 142 (xxii).

A schedule of classification of timber showing how to calculate its outturn in cubic contents :—

Class.	Length.	Girth.	Description.	Calculation of cubic contents.	Remarks.
A	9' and over	9" to 24"	Rafters	c.ft. 1.0	Girth measurements taken in centre.
B	6' to 10'	Stack measurements 5' x 5'.	Fuel stacks	50.80	One third cubic contents of stack.
C	Any length	Mean girth 9"	Cartload	.. .45	
			Bullockload	.. .4	
			Ass-load	.. .3	
			Headload	.. 1.5	
			Thorns	.. One-sixth cubic contents of stack.	
D	(i) Charcoal to be considered as taking double the number of cubic feet for each of the above bullock, ass and headloads. (ii) An average cartload contains 60 cubic feet of charcoal. (iii) An average cart takes 15 to 20 bags of charcoal ; each bag containing 3 maunds.				

APPENDIX L.

[Section 142 (xxiii).

Form of certificate to be sent by the Range Forest Officer, after examining the coupe.

I, _____, Range Forest Officer, _____, certify that I have personally examined coupe No. _____ of Block No. _____ of _____ Range.

I. Details of the work done by the contractor according to the terms of agreement :—

1. Stools of the trees cut have been dressed properly.
2. Stumps of trees are not covered with branchwood, etc.
3. Reserves have been well protected and are correct according to the Form given in para. V of the rules for the selection of reserves.
4. Roads have been fire-traced according to the terms of agreement.
5. Proper arrangements have been made to prevent cattle from grazing in the coupe and no damage has been done to the stools by cattle.

II. Details of work done at Government expense or with the assistance of guards, as the contractor did not work according to the terms of his agreement :—

1. Contractor's uncut trees have been cut.
2. Arrangements made to clear the coupe of timber and firewood by the contractor.
3. Undressed stumps dressed.
4. Stumps of cut trees cleared.
5. Roads have been fire-traced.
6. During the whole working season cattle grazing in the coupe were impounded.
7. Damage was done to _____ reserves and no trees were taken instead. A detailed statement in this matter accompanies.
8. If no trees have been taken instead the reasons should be given here.
9. Of the uncut trees found on rocky ground (or if there is some other reason it should be mentioned) _____ have been reserved, marked and numbered.

This certificate is given after personal examination of the coupe.

Range Forest Officer.

APPENDIX M.

[Sections 130 & 230.]

List of books, registers, etc., required to be maintained in the different subordinate offices.

Serial No.	Description.	Manual Form No.
RANGE OFFICE.		
1	Record of reserved and other kinds of forest ..	1
2	Register of Malki lands from which wood is allowed to be removed ..	....
3	Records of Rounds and Beats with names of forests (if unorganised) or blocks or compartments (if organised) and area of each forest ..	75
4	Register of stores, tools and plant ..	16
5	Register of work done by live-stock and of expenditure on upkeep of the same ..	App. XVII
6	Bill book ..	13
7	Receipt book ..	14
8	Cash book and cash account file ..	24 & 25A
9	Acquittance rolls file ..	27A
10	Contractors' ledger ..	33
11	Timber and kirkol permit books ..	15 & 15A
12	Register of pass and other important books ..	....
13	Register of fires ..	....
14	Register of leave ..	81
15	Register of printed books and maps ..	45
16	Forest Journal ..	....
17	Diary book ..	....
18	Register of receipts and issues of documents English and Vernacular ..	46
19	Despatch book including stamp account and delivery book ..	....
20	A and B record sorting lists ..	44 & 44A
21	Order book in which the Divisional Forest Officer enters orders ..	....
22	Standing Order file ..	....
23	Working Order file ..	....
24	Record of shooting licenses ..	....
25	First offence report book ..	....
26	Book of licenses for sawing timber ..	....
ROUND OFFICE.		
1	Record of reserved and protected forests ..	1
2	Records of Beats with names of forest or block and compartments and area of each forest ..	75
3	Register of lands leased ..	74
4	Register of stores, tools and plant ..	16
5	Receipt book ..	14
6	Timber permit hatkharda ..	....
7	Kirkol permit book ..	15A
8	Pass books ..	....
9	Cash book and cash account file ..	24 & 25B
10	Register of grazing collections ..	....
11	Acquittance rolls file ..	27A

Serial No.	Description.	Manual Form No.
ROUND OFFICE—continued.		
12	Diary book .. .. .	....
13	Register of receipts and issues of documents .. .. .	....
14	Despatch book including stamp account and delivery book .. .. .	....
15	Order book in which the Range Forest Officer and the Divisional Forest Officer enter orders .. .. .	....
16	Vernacular Standing Order file .. .. .	....
17	Working Order file .. .. .	....
18	First report and enquiry report books .. .. .	....
19	Register of offenders .. .. .	....
20	Register of agricultural implement wood given out .. .. .	....
DEPOT OFFICE.		
<i>Forest Depot.</i>		
1	Jungle (felling) register kept by Kamgari guards	5, 5A and 76 where necessary.
2	File of monthly returns of receipts and issues in Forest Depots (Progress reports)	6 & 6A
3	Pass book .. .. .	....
4	First report book .. .. .	....
<i>Sale Depot.</i>		
1	Register of receipts in depots	7 & 77 where necessary.
2	Register of disposals in depots	8
3	File of monthly returns of receipts and issues in depots.	9
4	Bill book	13
5	Receipt book	14
6	File of sale slips .. .. .	....
7	Cash book and cash account file	24 & 25A
8	Pass books .. .. .	....
9	Wagon pass register .. .. .	....
10	First report book .. .. .	....
11	Enquiry report book .. .. .	....
12	Register of dead stock	16
13	Register of receipts and issues of documents	46
14	Despatch book including stamp account and delivery book .. .. .	....
NAKA OFFICE.		
1	Pass book .. .. .	....
2	Wagon pass register .. .. .	....
3	Passes checking register .. .. .	....
4	Permit book	15A
5	Cash book and cash account file	24 & 25B
6	First report book .. .. .	....
BEAT GUARDS.		
1	Diary book .. .. .	....
2	First report book .. .. .	....
3	Register of kirkol permits .. .. .	....