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MARCH, 1937

No. 3.

THE MADRAS Forest College Magazine.



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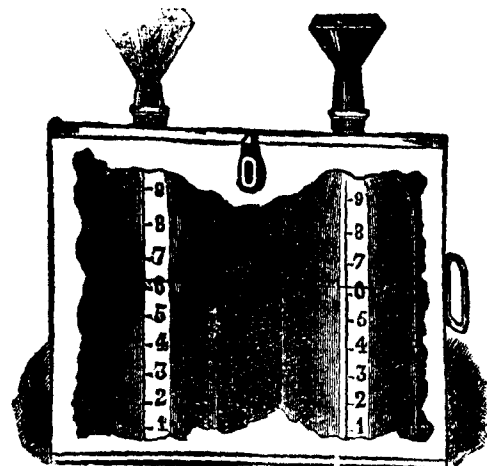
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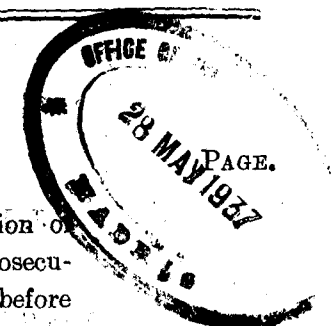
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CONTENTS.

No.

1. Hints on the Collection and Preparation of evidence, and the Conduct of Prosecutions in trials of Forest Cases before Magistrates.
— By, Rao Sahib, V. N. Seshagiri Rao,
B.A., Instructor, Madras Forest College. ... 93
2. COLLEGE NOTES. ... 109
3. EXTRACTS :
 - (1) Making Matches ... 117
 - (2) Forest Administration Report for Madras, 1935-36 ... 119
 - (3) Note on decapitalization of epithets in plant names. ... 121
 - (4) Survey of forest types of India and Burma. ... 122
 - (5) Forest Research in India, 1934-35. ... 122
4. International Year Book of Forestry Statistics, 1933-35. ... 128
5. Notifications relating to Rangers. ... 130





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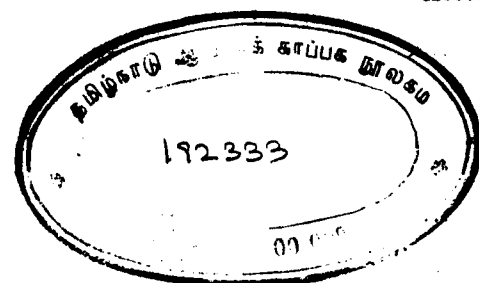
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**Hints on the Collection and Preparation of evidence,
and the Conduct of Prosecutions in trials of
Forest Cases before Magistrates.**

By
Rao Sahib V. N. Seshagiri Rao.

The word "trial" is not defined in the Code. It means according to Wharton's Law Lexicon "the examination of a case, civil or criminal, before a judge who has jurisdiction over it, according to the laws of the land. It means the proceedings which commence when the case is called with the Magistrate on the Bench, the accused in the dock, and the representatives of the prosecution and the accused are present in the Court for the hearing of the case. It includes the taking of evidence in the support of the prosecution which ends with the judgment, or other final order which is either a conviction or an acquittal or a discharge."

Now, Forest Officers engaged in forest cases are either investigators or prosecutors. An investigating officer's duty is to collect and arrange his evidence. The success of an investigating officer depends upon a good working knowledge of the

requirements of the law in the matter of *evidence* and *procedure*. The following rules, based on experience, will be of some use to investigating officers :—

The British law presumes that every man is innocent until the contrary is proved. It is an established rule that moral conviction of the guilt of the accused is under no circumstances a substitute for legal proof. 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.

It is not at all necessary for the prosecution, in order to establish a charge of crime, to prove a motive for it, much less the adequacy of that motive, in cases where there is satisfactory evidence that the accused has committed the offence.

When appearances are against the accused in a case, and the prosecution has established *prima facie* the existence of incriminating circumstances to prove that the accused is guilty, it is the duty of the defence to rebut the presumption arising from them by some tangible evidence other than by mere criticism, or suggestions or untested and uncorroborated statements from the dock.

The prosecution must prove the place, time and the precise circumstances as laid in the first information. The case for the prosecution must be proved by the evidence of the crown witnesses and cannot be based on the partial admission of the accused in his defence. Experience has shown that some forest officers commit the mistake of being content with confessions before them, 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 the accused. It will be advisable, therefore, to obtain evidence just as if no confession had ever been made. However, confessions are relevant and can be proved, provided they are not made before a Police Officer. Confession before any other person and even before a Village Magistrate is admissible and may be proved.

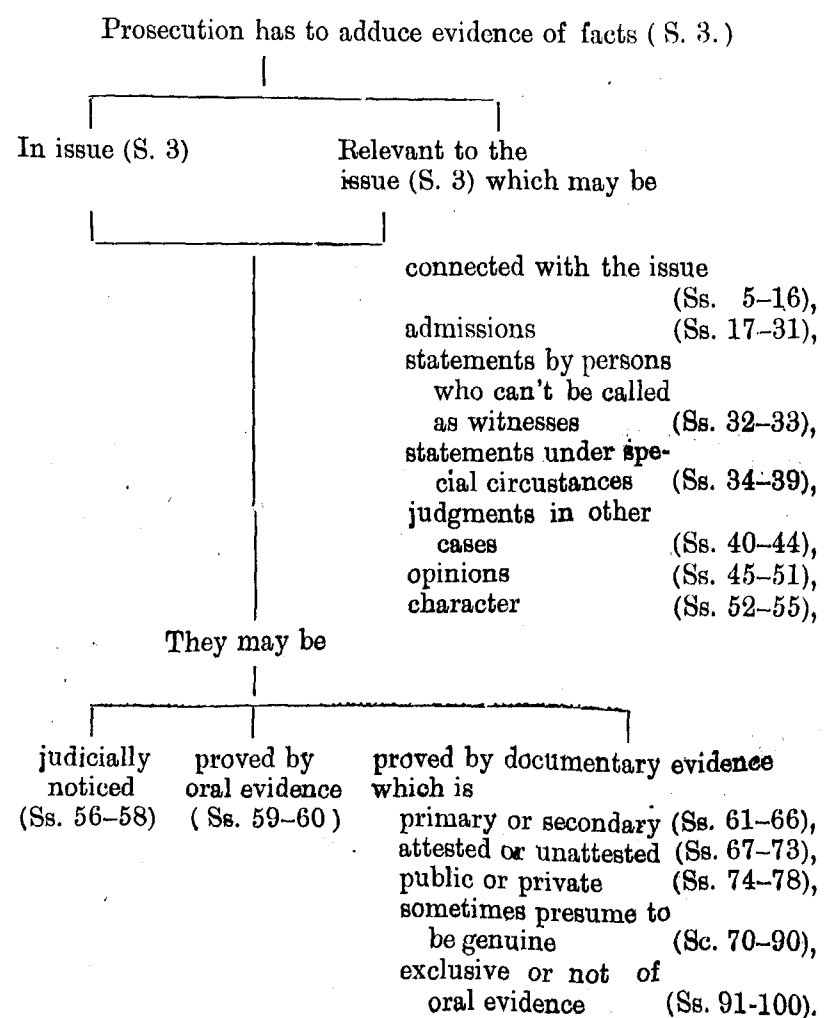
The prosecution is not entitled to succeed merely by proving the defence story to be false. Proof depends on affirmative facts and not on any want of explanation by the accused. An accused owes no duty to the prosecution, and is under no liability to give an explanation. The accused cannot be barred from setting up inconsistent pleas. It is a well known law that an accused person cannot be compelled to answer any question put to him nor be cross examined and that any statement made by him is privileged absolutely, however false or defamatory it might be.

A Court is not justified in evolving a new theory different from the one put forward as a definite case by either side nor has it power to refuse to examine witnesses put up by either side unless it is of opinion that such witnesses are put in to protract the trial unnecessarily. A magistrate should not take the role of the prosecutor and take upon himself the privilege to examine the witnesses and elicit facts against the accused.

The prosecuting officer is to be an assistant of the Court in the furtherance of justice and not to aim at conviction primarily. His function is to assist the court in arriving at the truth. In England a Sergeant-at-law used to be addressed as 'brother' by judges — a very excellent way of reminding that they are brethren engaged in the administration of justice. It is not enough if the investigating Forest Officer has understood his case. He must be able to make the Court understand it. He must arrange his evidence in proper sequence of events, and state his case fair and square, weighing his evidence. He should not charge a case until the chain of evidence is complete.

The *burden of proving* the guilt of the accused is on the prosecutor. If on such proof as he adduces there is a reasonable doubt as to his guilt, the accused is entitled to the benefit of the doubt. But if the evidence establishes the truth of the charge and satisfies the reason and judgment of those who are bound to act conscientiously upon it such evidence must be taken as proof beyond reasonable doubt justifying conviction.

The law of evidence lays down the method by which persons interested may apply the substantive law to particular cases, and establish the case set up in the complaint. It determines (1) what sort of facts may be proved in order to establish the offence complained of, (2) what sort of proof to be given of those facts, (3) who is to give it, and, (4) how it is to be given. The following tabular form illustrates the scheme of the Indian Evidence Act :—



Evidence should be confined to what are called *facts in issue*, (ie, facts which may by themselves, or in connection with other facts constitute such a state of things that the existence of the liability would be a legal inference from them) and *relevant facts* (ie, facts which are not themselves in issue but which may affect the probability of the existence of facts in issue, and be used as a foundation of inferences respecting them. They must be admissible according to the provisions of the Evidence Act. It must not be unnatural or unusual or impossible. By 'unnatural' evidence is meant 'got up or fabricated' evidence. Many people are under the erroneous impression that the Prosecution fabricates evidence and that it is its duty to do so, as it want a conviction. The Forest Officers by their conduct must be able to convince the public and the Court that that impression is not true and that their aim is justice and not conviction.

To prove a fact in issue or relevant fact the best possible evidence which the nature of the case is capable of should be produced. The evidence must be direct. If it refers to a fact which could be seen it must be the evidence of a witness who says he saw it. If it refers to a fact which could be perceived by any other sense or in any other manner it must be the evidence of a witness who so perceived. If it refers to a document, and the same is in existence, it must be document itself, though secondary evidence of it is allowed by law under certain circumstances. Documents are either public or private. Public documents are generally presumed to be genuine and their proof is not required. But execution of private documents should be proved before they are admitted as evidence. If a document is proved or alleged to have been executed by a person, the signature or handwriting must be proved to be his or in his hand writing. If a document is required by law to be attested, at least one attesting witness should be called to prove its execution if the witness is alive and subject to the process of the Court and capable of giving evidence. In the case of a private document which purports, or is proved, to be thirty years old and comes from a proper custody, the Court may presume it to be

genuine. As regards production of official documents certain instructions are issued by Government which must be borne in mind by the Forest Officers in charge of cases. (Vide appendix.)

In all cases direct evidence is the best and likely to be conclusive. Circumstantial evidence should be given only when it is impossible to give direct evidence. There may be some facts which are too notorious to require proof and the Court will take judicial notice of them. Opinions and impressions are not evidence except in certain cases e. g. of finger prints and handwriting experts.

Statements (written or verbal) of a person who is (1) dead, (2) who cannot be found, (3) who is incapable of giving evidence, (4) whose attendance cannot be procured without unreasonable delay or expense are relevant under the following circumstances:-

1. When it relates to the cause of his death,
2. When it is made in the course of business,
3. When it is against the interest of the maker,
4. When it gives opinion on questions of public general interests of persons *ante litem motem* (anterior to the litigation),
5. When it relates to statements made *ante litem motem* of persons who had special means of knowledge in question of relationship,
6. When it relates to the existence of any relationship between persons deceased and is made on any will or deed, or family pedigree, or upon any tomb, stone, or family portrait, and was made before the question in dispute arose,
7. When it is made by a number of persons and express feeling relevant to the matter in question. (Section 32, Indian Evidence Act).

Evidence must not be such as to prove anything more than is necessary. No attempt should be made to pile up evidence. It is ruinous to the case. Mere numerical strength of witnesses

does not establish the truth of the prosecution. It is sensible to examine a small number of reliable witnesses rather than a large number who contradict one another and crash the case.

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

Never commit the mistake of giving colour or 'padding' to the evidence. If the cross-examination Counsel is a clever man, and knows his job, he will expose the falsity of the evidence easily. Even if the evidence is found to be partially coloured the whole will be distrusted.

Witnesses:

In selecting witnesses, wherever possible, respectable men should be preferred 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. Such persons should not be cited unless unavoidable.

All persons are competent to testify unless the Court considers that they are prevented from understanding the question put to them or from giving rational answers to questions by tender years, extreme old age, disease, whether of body or mind, or any other cause of the same kind. A lunatic is not incompetent to testify unless he is prevented by his lunacy from understanding the questions put to him and giving rational answers to them. (118 Evidence Act).

To every witness the Court before examination, administers an oath in the form prescribed by the High Court. Every Court is bound to administer oath to witnesses and every witness is bound to take the oath administered. Refusal to take oath by a witness is an offence under the Penal Code, (S. 178 I.P.C.).

The evidence of witnesses should be taken only orally in open court. A witness who is unable to speak may give evidence by writing or by signs or in any other intelligible manner.

An accomplice is generally considered unworthy of credit and it is considered unsafe to base conviction on his testimony unless it is corroborated in material particulars by independent testimony of reliable character. But a Court is not precluded from relying on that testimony alone if in its opinion it is trustworthy. An accomplice is competent to give evidence against an accused person and a conviction is not illegal merely because it proceeds upon an uncorroborated testimony of an accomplice. (Sec. 133 Evidence Act.). Generally Courts will be slow to act under this power. The Forest Officers should therefore not lose sight of the fact that they should get corroborative evidence in such cases wherever possible.

Examination of Witnesses.

Examination of a witness consists of three parts, viz., — Examination-in-chief, Cross-examination, and Re-examination.

Examination-in-chief is the examination of a witness by the party who calls him. Cross-examination is the examination by the adverse party. Re-examination is the examination that takes place subsequent to the cross-examination. Witnesses should be first examined in chief, then, if the adverse party so desires, cross examined and then, if the party calling so desires, re-examined, to explain away facts elicited in cross examination.

Leading Questions: It is important to know what a 'leading question' is. (Sec. 141). Any question suggesting the answer which the person putting it wishes or expects to receive is called a 'leading question'. The art of chief examination is not easy. Inexperienced Forest Officers give room to pleaders on the opposite side, to raise objections to questions put by such officers in their examination-in-chief, on the ground of such questions being *leading*. Officers ignorant of the rules 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, gets confused. The following rules regarding leading questions should be borne in mind:—

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 Court may always permit leading questions as to matters (1) which are merely introductory, (2) which are not disputed, and (3) which, in the opinion of the Court, have already been sufficiently proved. Leading questions may always be asked in cross-examination.

The Court may allow a party to cross examine his own witness if in its opinion he has proved hostile. A witness may be cross examined as to previous statements made by him but if it be intended to contradict him by a writing, then his attention should be called to the portion in it sought to be contradicted. (S. 145). In cross examination, questions may also be asked of a witness to test his veracity, to discover who he is, and his position in life and to shake his credit by injuring his character although the answer to such questions might tend to criminate him or expose him to any penalty or forfeiture. (Section 146).

The credit of a witness may be impeached in the following ways:— (i) By the evidence of persons who testify that they believe him, from what they know of him, to be unworthy of credit; (ii) by proof that the witness has been open to bribery or other corrupt influence; (iii) by proof of former contradictory statements made by the witness. (Sec. 148 Evidence).

The law compels every person to attend in obedience to a summons to give evidence to help in the administration of justice. When so compelling, it is not unmindful of the inconvenience and risks to which witnesses may be exposed and has therefore provided the necessary safeguards. A witness giving evidence is

prima facie performing a public duty. The degree to which he may properly be pressed depends on circumstances, but it is subject to the general principle that the purpose in view is to get out the truth, not to force on the witness admissions that confuse or distort it. Questions intended to shake one's credit by injuring his character should not be asked unless a person asking it has reasonable grounds for thinking that the imputation which it conveys is well founded. Evidence to contradict answers to questions testing the veracity of a witness is excluded, except in the following cases :—

Where a previous conviction, or a suggestion tending to impeach impartiality, is denied when it may be proved or contradicted. The privilege does not extend to the barring of prosecution of the witness for giving false evidence. The court may also forbid questions which are intended to insult or annoy or which are indecent or scandalous unless very relevant to the enquiry. (Section 152, Indian Evidence Act).

There is also a provision that where a witness is compelled to answer a question the answer to which will expose him to criminal prosecution, such answers should not be used against him in subsequent criminal proceedings. (Section 132, Indian Evidence Act).

Witnesses are also privileged or precluded from not answering questions as to particular matters. For instance no person shall be compelled to disclose any communication made to him or her during marriage by any person to whom he or she has been married. A public officer cannot be compelled to disclose communications made to him in official confidence.

A person may refresh his memory while under examination by referring to any writing made by himself either at the time of the transaction or soon after, concerning which he is questioned, and an expert may refresh his memory by referring to professional treatises (Section 159, Evidence Act).

No police officer may be compelled to speak to the sources of information as to the commission of any offence.

A Magistrate in order to discover the truth may ask any question he pleases at any stage of the proceedings about any matter relevant or irrelevant and he may order the production of any document or thing and no party is entitled without the leave of the Court to cross examine upon the answer to any such question.

The handling of witnesses in the box requires considerable tact on the part of the prosecuting officer. The rules laid down by Paul Brown, one of the famous American Lawyers, regarding the examination of witnesses quoted below *in extenso* will be a useful guide.

Examination-in-Chief :

1. If your witnesses are bold, and may injure your cause by pertness or forwardness, observe gravity and ceremony of manner towards them which may be calculated to repress their assurance.

2. If they are alarmed or diffident, and their thoughts are evidently scattered commence your examination with matters of familiar character, remotely connected with the subject of their alarm, or the matter in issue; as for instance,—Where do you live? Do you know the parties? How long have you known them? etc. And when you have restored them to their composure, and the mind has regained its equilibrium, proceed to the more essential features of the case, being careful to be mild and distinct in your approaches, lest you may again trouble the fountain from which you are to drink.

3. If the evidence of your own witnesses be unfavourable to you (which should always be guarded against), exhibit no want of composure; for there are many minds that form opinions of the nature or character of testimony chiefly from the effect which it may appear to produce upon the counsel.

4. If you perceive that the mind of the witness, is imbued with prejudices against your client, hope but little from such a quarter, unless there be some facts which are essential to your

client's protection and which that witness alone can prove, either do not call him, or get rid of him as soon as possible. If the opposite counsel perceives the bias to which I have referred, he may employ it to your ruin. In judicial inquiries, of all possible evils, the worst and the least to be resisted is an enemy in the guise of a friend, you cannot impeach him, you cannot cross examine him; you cannot disarm him; you cannot indirectly even assail him, and if you exercise the only privilege that is left to you and call other witnesses for the purpose of explanation, you must bear in mind that, instead of carrying the war into the enemy's country the struggle is still between sections of your own forces, and in the very heart, of your own camp. Avoid this by all means.

5. Never call a witness whom your adversary will be compelled to call. This will afford you the privilege of cross examination, take from your opponent the same privilege it thus gives to you—and in addition thereto, not only render everything unfavourably said by the witness, doubly operative against the party calling him, but also deprive that party of the power of counteracting the effect of the testimony.

6. Never ask a question without an object, nor without being able to connect that object with the case, if objected to as irrelevant.

7. Be careful not to put your question such a shape that, if, opposed for informality, you cannot sustain it, or at all events, produce strong reason in its support. Frequent failures in the discussion of points of evidence enfeeble your strength in the estimation of the jury and greatly impair your hopes in the final result.

8. Never object to a question from your adversary without being able and disposed to enforce the objection. Nothing is so monstrous as to be constantly making and withdrawing objections. It either indicates a want of correct perception in making them, or a deficiency of real or of moral courage in not making them good.

9. Speak to your witness clearly and distinctly, as if you are awake and engaged in a matter of interest, and make him also speak distinctly to your question. How can it be supposed that the court and jury will be inclined to listen when the struggle seems to be whether the counsel or the witness shall first go to sleep?

10. Modulate your voice as circumstances may direct, Inspire the fearful, and repress the bold. 'Never begin before you are ready, and always finish when you have done. In other words, do not ask questions for questions' sake, but for an answer.

Rules for cross examination:—

1. Except in indifferent matters, never take your eye from that of witness. this is a channel of communication from mind to mind; the loss of which nothing can compensate.

2. Be not regardless of the voice of the witness; next to the eye, this is perhaps the best interpreter of his mind. The very design to screen conscience from crime—the mental reservation of the witness—is often manifested in the tone or accent or emphasis of the voice.

3. Be mild with the mild, shrewd with the crafty; confiding with the honest; merciful to the young, the frail or the fearful; rough to the ruffian, and thunderbolt to the liar. Bring to bear all the powers of your mind, not that you may shine, but that virtue may triumph, and your cause may prosper.

4. In a criminal, especially in a capital case, so long as case stands well ask but few questions, and be certain never to ask any, the answer to which if against you, may destroy your client's case unless you know the witness well, and know that his answer will be favourable, or unless you be prepared with the testimony to destroy him, if he play the traitor to the truth and your expectations.

5. An equivocal question is almost as much to be avoided and condemned as an equivocal answer. Singleness of purpose, clearly expressed, is the best trial in the examination of witnesses, whether they be honest or the reverse. Falsehood is not detected by cunning, but by light or truth, or if by cunning it is cunning of the witness and not of the counsel.

6. If the witness is determined to be witty, or refractory with you, you had better settle that account with him first or its terms will increase with the examination. But, be careful not to lose your temper; anger is always either the precursor or evidence of assured defeat in every intellectual treat.

7. Like a skilful chess player, in every move fix your mind upon the combinations and relation of the game!; partial and temporary success may otherwise end in total and remediless defeat.

8. Never undervalue your adversary, but stand steadily upon your guard; a random blow may be just as fatal as though it were directed by the most consummate skill, the negligence of one often cures and sometimes renders effective the blunders of another.

9. Be respectful to the Court and to the Jury, kind to your colleagues, civil to your antagonist, but never sacrifice the slightest principle of duty to an overweening deference towards either.

APPENDIX.

Procedure to be followed when a Government servant is summoned by a court to produce official documents for the purpose of giving evidence.

The law relating to the production of unpublished official records as evidence in courts is contained in sections 123, 124 and 162 of the Indian Evidence Act, 1872 (Act 1 of 1872), which are reproduced below:—

“123. No one shall be permitted to give any evidence derived from unpublished official records relating to any affairs of State, except with the permission of the officer at the head of the department concerned, who shall give or withhold such permission as he thinks fit.

124. No public officer shall be compelled to disclose communications made to him in official confidence when he considers that the public interests would suffer by the disclosure.

162. A witness summoned to produce a document shall, if it is in his possession or power, bring it to court, notwithstanding any objection which there may be to its production or to its admissibility. The validity of any such objection shall be decided on by the court.

The court, if it sees fit, may inspect the document, unless it refers to matters of State, or take other evidence to enable it to determine on its admissibility.

If for such a purpose it is necessary to cause any document to be translated, the court may, if it thinks fit, direct the translator to keep the contents secret, unless the document is to be given in evidence: and if the interpreter disobeys such direction, he shall be held to have committed an offence under section 166 of the Indian Penal Code.”

2. For the purposes of section 123 above, the expression ‘officer at the head of the department’ may be held to mean the head of the office in whose custody the document required by the court is, and vis-a-vis, the court which demands its production, that officer should be treated as the authority to withhold or give the necessary permission.

3. In respect of documents emanating (1) from a higher authority, viz., His Majesty’s Government, the Secretary of State for India, the Government of India, or the local Government, or which have formed the subject of correspondence with such higher authority, or (2) from other Governments, whether foreign or Dominion, the head of the department should obtain the consent of the Government of India through the usual official channels before agreeing to produce the documents in court, or allowing evidence based on them, unless the papers are intended for publication, or are of a purely formal or routine nature when a reference to higher authority may be dispensed with.

4. In the case of papers other than those specified in paragraph 3 above, the head of the department should not allow production of the correspondence if it relates to matters which are generally regarded as confidential, or disclosure of which would in his opinion be detrimental to public interests, or to matters which are in dispute in some other connexion, or have given rise to a controversy between Government and some other party.

5. In a case of doubt the head of the department should invariably refer to higher authority for orders.

7. The Government servant who is to attend a court as a witness with official documents should, where permission under section 123 has been withheld, be given an order duly signed by the head of the department in the accompanying form. He should produce it when he is called upon to give his evidence, and should explain that he is not at liberty to produce the documents before the court, or to give any evidence derived from them. He should, however, take with him the papers which he has been summoned to produce.

8. The head of the department should abstain from entering into correspondence with the presiding officer of the court concerned in regard to the grounds on which the documents have been called for. He should obey the court's orders and should appear personally, or arrange for the appearance of another officer in the court concerned, with documents, and act as indicated in paragraph 7 above, and produce the necessary certificate if he claims privilege.

Summons from the court of the _____ for the
production at _____ of the office files relating
to the _____

- (a) I direct to appear with the files mentioned in the summons and to claim privilege for them under section 123 of the Evidence Act.
- (b) I withhold permission to give any evidence derived from the files for which privilege is claimed under this order.

It should be represented to the court that those files contain unpublished official records relating to affairs of State for the purpose of section 123 and that in view of the provisions of section 162 of the Evidence Act, the files are not open to the inspection of the court

Head of Department.

I. Students' Club Day, 1937.

This annual event took place at the Club on Saturday, March 20th. Besides the Principal and staff, the guests included among others, Mr. & Mrs. M. A. T. Coelho (Additional Sessions Judge, presiding), Mr. T. K. Doraiswami Aiyer (Principal, Local Govt. College), Mr. T. Raju Pillai (Principal, Central Recruits School), Mr. K. Krishnamurthy Rao, (Assistant Sugar Cane Expert to Govt. of India), Mr. & Mrs. M. C. Cherian (Govt. Entomologist), Mr. & Mrs. Cherian Jacob (Systematic Botanist, Agricultural College), Mr. & Mrs. C. R. Potts (Stanes & Co), Mr. & Mrs. C. G. Ponnappa (Municipal Civil Engineer, Mr. and Mrs. Odayar (Assistant Director of surveys), Mr. & Mrs. H. Shiva Rao (Lecturer in chemistry) and Mr. Venkatakrishna Mudaliar (Assistant Mycologist).

At long tables tea etc was served soon after 5 P.M., and while all were seated having refreshments, students of the Junior Division, A. A. Golandaz and S. Seshagiri Rao Naidu as a pair and R. P. Patnaik (Senior student)—separately—entertained the audience in fancy dress. The first named pair represented the 'Nautch girl and the Nautch master' and R. P. Patnaik with a bundle of sticks, a lunatic caught in the act of committing forest offence.

Then all moved indoors and a programme of about 10 items of variety entertainment was enacted on the stage, as follows:—

By the boys of the R. S. Puram Elementary School :—

Violin Solo ... Srikantan.

Vocal Music ... Kannan

Song and dance by *Kuravan* and *Kurathi* (boy and girl tattooist).

This was a very popular item and got a prize.

By the Forest College students :—

Telugu song, by Senior student S. V. Venkataraman.

A dramatic episode, by R. P. Patnaik.

A Maharashtra song, by student Umbarge (Junior).
Hindustani and Telugu songs by Junior Student
C. Varadarajulu.

Conjuring by Senior Student M. M. Sheikh.

The Club's Hony. Secretary, Student S. F. Uppin, then requested Mrs. Coelho to give away the prizes which had been won as follows:—

1. Carrom singles : Champion, 1st prize B. D. Nadkarni
(Senior)
2. " Runner up, 2nd prize S. Seshagiri Rao
Naidu (Junior)
3. Ping Pong singles; Champion, 1st prize D. M. Mannige
(Senior)
4. " " Runner up, 2nd prize S. M. Wagle (Junior)
5. Auction Bridge, Champion, 1st prize G. L. Amarasekhara
& E. G. De Souza.
(Seniors)
6. " Runner up, 2nd prize A. G. W. de Silva,
(Senior) & P Perera.
(Junior)
7. Carrom Doubles ; Champion, 1st prize N. P. Choksi &
P.K. Patnaik (Seniors)
8. " Runners up, 2nd prize S. Seshagiri Rao
Naidu (Junior) &
S. F. Uppin (Senior)
9. Best Actor R. P. Patnaik
(Senior)
10. Fancy dress : A. A. Golandaz &
S. Seshagiri Rao
Naidu (Juniors)

The Elementary School boys were also given prizes for their acting.

The president, Mr. Coelho spoke on the benefits of club life, and the function came to a close with a vote of thanks to the President and the guests of the evening.

II. Marathon Race — 1937.

7 Miles — Held on Saturday the 27th February 1937
at 6-30 p. m.

S.No.	Name.	Division.	Time.
1.	C. C. Monnappa	Madras.	Senior. 50 minutes.
2.	S. F. Uppin.	Bombay.	do. 52 „
3.	A. A. Golandaz.	do.	Junior. 57 „
4.	S. H. Bagot	Ceylon.	do. 57 „
5.	Md. Abdul Kader.	Hyderabad.	Senior. 58 „
6.	V. B. Koppikar	Bombay.	Junior. 58.30 „
7.	I. A. Fernandez.	Madras.	do. 59 „
8.	B. C. Pal.	do.	do. 60 „
9.	C. Varadarajulu.	do.	do. 61. „
10.	B. D. Nadkarni.	Bombay.	Senior. 61.30 „

This was not much in the way of a race as C. C. Monnappa won very easily. S. H. Bagot would have finished higher but mistook the turn at the Clerks' quarters and went round by the Museum. 43 students completed the course.

The individual cup was awarded to student C. C. Monnappa and the aggregate cup to the Junior Division by a narrow margin.

III. Association Football.

A. Forest College, versus, "Lily Rose," on March 12th, 1937.

This match of 50 minutes was played on our ground against a team composed mostly of old Government College students. Our opponents scored four times in the first half, and once in the second, thus winning with ease by 5 goals to nil. This was the first match which the Forest College had had since June 1936. The Lily Rose players were quicker on the ball, kept the ball on the ground, and found each other with their passes. They scored 4 times in the first 15 minutes,

but, thereafter were mostly ineffective. Their captain was the best footballer on their side. For the home team the forwards failed to combine, and did not shine individually, so much so, that the Lily Rose goal keeper only handled the ball once and that a weak shot. The forwards were disorganised due, no doubt, partly to an accident to A. A. Memon, who was playing an energetic game. He fell on his right wrist and fractured the big bone, and it had to be set in hospital. By permission of the opposing skipper, A. Olimuthu took his place and played full back. On our side the captain Md. Abdul Qadir at half back played as well as anyone. P. Indersen was a good trier at half back. The team as a whole was disappointing. They will probably do better next time, especially the forward line.

Teams: Forest College: E. G. De'Souza, (goal), S. H. Bagot and G. L. C. Amarasekara (backs), Muhammad Abdul Qadir, I. A. Fernandez and P. Indersen (half backs), G. Ananthathirthan, V. S. Holkar, Kumar Duleepsinh, A. A. Memon and K. Narayanamoorthi (forwards).

B. Forest College versus Students' Club, Coimbatore.

Drawn 1-1:—

This match was played on March 22nd, on our ground at 5-15 P. m. Two periods of 25 minutes were played. At the start the visitors played only 9 men, the other two arriving later. Despite this handicap they were the first to score, after 15 minutes. Seven minutes later, the College equalised through G. Ananthathirthan and at half time the score was one goal all. In the second half, play continued even, and there was no further scoring. In this match the College gave an improved display, while the Coimbatore team were good in mid field but spoiled their attacking movements by over elaboration, and were seldom dangerous in front of goal. A. A. Memon was absent from the College team through a broken wrist sustained in the previous match and G. Ananthathirthan, although unfit, played a plucky game.

Teams:— Forest College:

L. H. Rodrigues (goal), A. Olimuthu and S. Sirajuddin (backs); S. H. Bagot, I. A. Fernandez, Muthammad Abdul Qadir, (half backs), G. Ananthathirthan, P. Inderson, Kumar Duleep Singh, V. S. Holkar and G. L. C. Amarasekara (Forwards).

Coimbatore Students' Club:

R. Lakshmayya (goal), H. M. Siddickulla and C. Rajamanikkam (backs), Karuppannan, C. Muhammad Batcha and Abdul Rahim (halves), L. A. Dominick, R. Shanmugam, C. V. Gopalan, G. Michael and R. Natarajan (forwards).

IV. Hockey Matches:

A. Forest College versus Central Police Recruits School, Coimbatore.

(Result: 2-1 win. Two periods of 25 minutes):—

Played on March 17th, 1937, on their ground which was the best in Coimbatore some years ago, but is now slower and rather rough. The start was delayed for 10 minutes by a sand storm. In the first 3 minutes of play the College had 2 or 3 chances to score. We continued to have more of the game than our opponents, and after about 15 minutes Duleep scored. Our half-backs controlled the play in the first half, and a score of 4 or 5 goals might well have resulted, but as it was, the teams crossed over at half-time with the Forest College leading by only one goal to nil. The pace had been fast, and on resuming, it looked as if the College players were feeling it, and would not last, but in the end they lasted quite as well as the Police team.

The latter however exerted pressure, and soon scored (1-1), and then had the better of the play for quite a long time in the second half, and looked likely winners. Sergeant Todd was prominent for the Police in this period, and played a good game all through, and their centre forward a Sub Inspector, a noted player in his time, made strong efforts to score. They forced a

number of short corners and had several free hits near our goal. Towards the close, the College came more into the picture again, and L. H. Rodrigues hit the winning goal (2-1). On our side the halves were outstanding. Among the forwards, the inside trio are unselfish and neat, but rely wholly on being fed by the halves, and never make an opening for themselves. Kumar Duleepsinh did not have one of his best days. The ball did not run kindly for him when he cut through at speed. The backs were good, but S. H. Bagot has played better. It looked as if he might have left several balls instead of stopping them. S. R. Umbarjee in goal gave nothing away.

This was a good game to watch, and all the play was clean and fair. It was noticeable that one umpire blew his whistle about 25 times for every time the other umpire below his.

Forest College team: S. R. Umbarje (goal), S. H. Bagot and I. A. Fernandez (backs), Muhammad Abdul Kader, E. G. DeSouza, S. F. Uppin (halves), A. Olimuthu, V. S. Holkar, Kumar Duleepsinh, L. H. Rodrigues and G. L. C. Amarasekara (forwards).

B. Forest College versus Stanes' School, Coimbatore.

(Lost 1-6):—

This match, a friendly, was played on March 23rd, 1937, on their ground. The game was fast and even during the first ten minutes, but after that our team slowed down, winded. After 15 minutes the score was 0-2, and the College team were tired men at the end. Some faults in our team were apparent:—

1. Lack of dash among the forwards. Duleep Sinh (Centre) shot our goal, but was mostly held up by the defence. He was disappointing.
2. The two inners kept too close to the centre forward fumbled, and were much too slow in shooting, when they did get into the ring.
3. The wing forwards did not keep their places and they centred feebly.

4. The half-back Line was the strongest part of the team, but all the three were winded before half time. In fact they were run off their feet and the school-boys just made rings round them, but it should be said that the captain E. G. DeSouza at centre half was scarcely fit to play owing to tummy trouble.
5. There was little or no understanding between the backs; and the goalie lacked anticipation.

For the school nearly all played well, the centre half and one of the backs being perhaps the best.

C. Forest College versus Stanes' School.

(Lost 0-3):—

This was a return match, played on our ground on April 2nd, and produced a fine, fast, evenly contested game. It would have been no surprise, on the run of the play, if the College had forced a drawn, but the centre forward Duleep Sinh was still, (for a man of his speed and ball control and shooting power), fatally weak, and further, the two goal keepers could not be compared. For this game DeSouza, our captain moved up to the forward line with great effect and greatly strengthened the attack. He also did a lot of work by dropping back to help the defence in time of need. The outsides played much better than last time, especially G. L. C. Amarasekara on the left. He plays with a left hand stick and it was amusing to see the discomfort, time after time, of the boy who had to mark him and who evidently had never seen a player with a left hand stick before. Amarasekara sent some nice centres across. L. H. Rodrigues ran fast and far and was always dangerous in attack. The halves did well, Abdul Kadir perhaps the best, but the pace was a trifle hot for them. They, and all the team, should go to bed early and have more sleep. Misra made a promising appearance at full back and with more experience he may do very well. More than anyone it was the school goal keeper who won the game for his

side. Ours is weak. To sum up, our centre forward and our goal keeper let us down: however, a splendid game, with the College showing much improved form.

Teams: Forest College:

S. R. Umbarje (goal); S. H. Bagot and S. D. Misra (backs); Abdul Kadir, V. S. Holkar and S. F. Uppin (halves); P. K. Patnaik, E. G. DeSouza (captain), K. Dileep Sinh, L. H. Rodrigues and G. L. C. Amarasekara (forwards).

V. Examiners for final examination, June 1937 :—

The Forest officers named below have been selected to examine the Forest College students in the subjects noted against each, in the final examination to be held in June 1937 :—

<i>Name of officer.</i>	<i>Subject.</i>
Messrs.	
1. A. R. Brand (Working Plans Officer, Nilambur Division, Ootacamund.)	} Forest Management.
2. J. M. Sweet (D. F. O., Wynaad)	
3. E. S. Dawson (Forest Engineer)	} Silviculture.
4. H. G. Hicks (D. F. O. Tinnevely)	
5. Md. Habibullah Sahib Bahadur (D. F. O., West Vellore)	} Survey & Drawing.
6. Md. Abdul Hafiz Sahib Bahadur, (Forest Utilization officer)	
7. W. C. Hart (D.F.O., Anantapur.)	} Range administration.
8. A. L. Griffith (Provincial Silviculturist)	
	} Botany.
	} Utilization.
	} Engineering.
	} Physical Science.

EXTRACTS.

I. Making Matches : (By, H. J. Shepstone) :

The story of the evolution of the match is an interesting one. Like so many articles in common use today, the ordinary match, so plentiful and cheap, and without which we should all be at a loss, was not evolved all at once, but is the result of one improvement upon another, spread over a considerable period.

Primitive man obtained his light by rubbing two pieces of wood together. The men of the Stone and Bronze Ages improved upon this method by striking a pointed flake of flint against a nodule of iron-pyrites. This produced the coveted spark. Later came the flint and steel method of obtaining a light. When struck together they produced a spark, hot enough to ignite a powder, known as tinder. By blowing this glow, sulphur matches could be lighted.

Up to about the year 1835, only a hundred years ago, a tinder box of some sort was to be found on the kitchen shelf of every dwelling in the land, and on the person of every smoker. In the latter case the tobacco was ignited direct from the glowing tinder, and it must have been a ticklish business on a windy day. As progress continued, it was felt that a quicker method of obtaining a light was needed, and this led to the invention of various ingenious but still rather clumsy chemical matches.

One, due to a Frenchman, Cagniard de la Tour, consisted of a match which could be lighted by dipping it into a bottle full of phosphorus mastic mixed with oxide of phosphorus. This was the real parent of the match lighted by friction, and was also the first employment of phosphorus in easy fire production. Credit for having invented the friction match, however, must be given to an Englishman, Mr. John Walker, a chemist, of Stockton-on-Tees. In 1826 he made a match headed with a composition which, though it did not contain phosphorus, ignited when rubbed on any rough substance. Nobody before had ever achieved so simple and wonderful a means of getting a light.

Walker charged one shilling for a hundred matches, and twopence for a round tin box in which they were packed. With each box was given a piece of sandpaper, which had to be doubled over the head of the match and nipped tightly while the

match was drawn out rapidly. For some reason or other Walker refused to protect his discovery by patents and it was not long before others were making and selling similar matches, in Europe.

Phosphoric matches of many kinds now appeared upon the market. They had queer names, such a lucifers, vestas, fuses, vesuvians, and so on. Many of them were extremely dangerous, as they ignited too readily. A box of them left on the kitchen mantelshelf, or on a window-sill, were liable to blaze up spontaneously in a hot sun, and many a house was set ablaze as a consequence. If a box received a sharp jar, that was sufficient to set it alight. More than once carriers' carts and wagons were set on fire and totally destroyed by the ignition of parcels of boxes of matches as the vehicles travelled over the rough roads. Even worse was the horrible disease contracted by match workers who made them, owing to the use of white phosphorus.

By degrees, all these disadvantages were eliminated. The too-ready ignition was reduced, and all danger of poisoning was removed by substituting for the noxious white phosphorus a harmless preparation. Such, in brief, is the history of the common match, the manufacture of which today calls for special and elaborate machinery. Indeed, it is a case of the wood going in at one end and emerging at the other as matches, packed neatly in boxes, ready for use.

In a modern match factory, in the yard you will find great stacks of timber, chiefly aspen and pine, the wood mostly favoured. The logs first pass to the saw mill where they are cut into suitable lengths, after which the outer bark and any irregularities are removed. The cut logs next pass to a machine, much the same as a veneer-cutting machine, which peels off long strips, the width of the log and the thickness of a match. These strips are known as veneer. They are taken and piled one above another, to a height of eighteen inches or a couple of feet, to pass into yet another machine which, with its series of knives, cuts them up into match splints. From the cutting machine the splints fall into a container, and are carried to a sifting machine which, by shaking them, removes all dust, the splints finally emerging lying lengthwise ready to receive their heads.

The machine which performs this work is perhaps the most wonderful piece of mechanism in a collection of wonderful machinery. The main part of this great machine is an endless band of steel, three to four feet in width, perforated with conical

holes. The splints neatly stacked together, are fed into the machine on a grooved plate, the grooves corresponding to the holes in the band. By means of a vibrating movement the splints are forced into the holes in the band, and hanging downwards, are first passed over a paraffin bath. Immediately afterwards they pick up the head mixture from a roller. Subsequently they pass slowly through the machine by a long path to allow the heads to set, finally falling into the box-filling section of the great machine.

Here the splints, which have now become matches, fall into a series of metal receptacles each the size of a match box. As they travel onwards plungers force the matches from the metal containers into the inner portions of the boxes. A moment later a similar operation forces the labelled outer cases over the inner portion. In another machine, the boxes moving along special conveyors, receive a coating of the striking material. A further automatic machine parcels them into dozens ready for the shopkeeper. Thus the whole operation is virtually automatic, obviating the need of any packing by hand.

Such is the romantic story of the common and humble match. It is a small thing, costing but a penny per box. But its manufacture needs delicate and intricate machinery, and in its world-wide millions, it must rank as one of the major wood-using industries.

— Wood ; December 1936.

2. Forest Administration Report for Madras, 1935—36 :

Reviewing the administration Report of the Forest Department for the year 1935-36 the Government of Madras observe as follows :

“ Though the total number of forest offences reported shows a slight increase over the figures of the previous year from 28,242 to 28,936, the Government are glad to note that the number of cases of injuries done to forests by fire decreased from 1,771 to 1,248 and of cases of unauthorized grazing from 4,586 to 4,353. The Government would like to see District Forest Officers personally investigating forest offences to a much larger extent than has been the case in the past. Their attention to the point was more than once drawn, and the Government regret to observe that the proportion of cases investigated by them continues to be small.

" The work of regeneration in timber forests, and in fuel forests, and of fresh afforestation, received due attention during the year under report, the area operated in timber forests under the clearfelling system being 3,945 acres and under the selection felling system 56,159 acres and in fuel forests 25,938 acres, and 2,581 acres under the coppice with standard system. An area of 50 acres was planted with casuarina in the Sriharikota Range in Nellore, thus bringing the total area so far planted to 353 acres. The afforestation of the Kudiramoliteri Reserved Forest in Tinnevely district to fix the shifting sand dunes was continued.

The output of timber increased by 35 per cent in the reserved forests and by nearly 16 per cent in the unreserves. The revenue realized from timber was 13.42 lakhs against 13.19 lakhs in 1934-35. The quantity of fuel removed by Government agency as well as by purchasers decreased during the year under review as also the value of bamboos removed. There was a larger removal of dead sandalwood during the year and the quantity sold also increased though the price realized fell from Rs. 701 to Rs. 687 a ton. There was an increase in the value of the outturn of minor forest produce. Lac cultivation was expanded on a considerable scale. Now that the Forest Research Institute, Dehra Dun, demonstrated that nondurable indigenous timber treated with 'ascu' is suitable and inexpensive for structural work, the Government hope that the department will endeavour to see that teak poles and pine poles are utilized for telegraph and telephone lines. Teak poles are already being used for the purpose in Mysore.

" Cattle admitted for grazing into reserved forests increased in numbers and the grazing revenue realized showed an increase of Rs. 18,481. But there was also an increase of Rs. 13,171 in the revenue foregone by the grant of free grazing and grazing at concessional rates.

" In paragraphs 105 to 108 of the report, the Chief Conservator of Forests describes the services the Forest department has rendered to the general community, which show that, consistently with silvicultural interests, the department makes every effort to meet all the reasonable domestic and agricultural requirements of the people. It is a satisfactory feature that dependence on reserved forests for manure leaf has decreased considerably and that the ryots have learnt either to grow their own requirements or to resort to panchayat forests for them.

" The financial position of the department in the year under review is explained in detail in the report. There was an

increase in revenue but the expenditure also advanced with the result that the net surplus of the year was only Rs. 2.16 lakhs against Rs. 3.43 lakhs in 1934-35.

The relationship between the department and the general public and between the department and the hill and jungle tribes is reported to have been generally satisfactory. But the Government consider that Forest Officers of all ranks should get into more personal touch with villagers than they do at present."

3. A note on decapitalization of epithets in plant names :

[By, Dr. J. Burt Davy, Imperial Forestry Institute, Oxford.]

" * * * * It is the normal practice of systematic botanists to use a small initial letter for the epithet (ie. the second part of a botanical name) when it takes the same gender form as the generic part of the name, ie, when it is an adjective. It is when either an old generic name (therefore a substantive), or a personal name, is used as an epithet, that it is still customary to capitalize the initial letter of the epithet.

Philological reasons may be advanced in favour of the customary practice, which often affords a clue to the origin of the epithet, but these are heavily outweighed by its practical inconvenience to those who have to use botanical names, but who have not ready access to good botanical libraries.

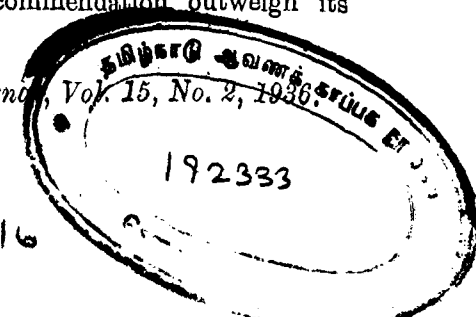
Another reason sometimes advanced against decapitalization is that it is " unscientific "; botanists have no right to claim that as a class they are more scientific than Zoologists.

The " International rules of botanical nomenclature " revised by the International Botanical Congress at Cambridge in 1930, and published in 1935, do not *prohibit* the disuse of capitals for specific epithets. The following recommendation is made : " Specific (or other) epithets should be written with a small initial letter, except those which are derived from names of persons (substantives or adjectives) or are taken from generic names (substantives or adjectives) ".

" * * * * Several botanists, strict supporters of the actual " Rules " have recognised, as have the Zoologists, that the practical disadvantages of such a recommendation outweigh its advantages. * * * * "

— Empire Forestry Journal, Vol. 15, No. 2, 1936.

JB d.m 211, N/6
N 38



4. Survey of Forest Types of India and Burma :

Mr. H. G. Champion in his book " Preliminary Survey of the Forest Types of India and Burma " has made a very exhaustive attempt to differentiate and classify the various main groups and types of forest in India and Burma as a whole. The author proposes the following provisional classification, which recognises fifteen main climatic groups or formations :—

I. Tropical Forests :

- (1) Wet evergreen forest (rain forest).
- (2) Semi-evergreen forest.
- (3) Moist deciduous forest.
- (4) Dry deciduous forest.
- (5) Thorn forest.
- (6) Dry evergreen forest.

[Also four types determined by special site factors, namely, beach, tidal, freshwater swamp and riverain forests.]

II. Montane Subtropical Forests :

- (7) Subtropical wet hill forest.
- (8) „ moist hill (pine) forest.
- (9) „ dry evergreen forest.

III. Montane Temperate Forests :

- (10) Wet temperate forest.
- (11) (Himalayan) moist temperate forest.
- (12) (Himalayan) dry temperate forest.

IV. Alpine Forests :

- (13) Alpine forest.
- (14) Moist alpine scrub.
- (15) Dry alpine scrub.

— Extract from " A Preliminary Survey of the Forest types of India and Burma "

5. Forest Research in India, 1934-35 :

General :

In Madras useful systematic research on planting technique for teak continues to be done. The advantages of pre-monsoon stump planting, previously reported, have received further valuable confirmation in an exceptionally dry season. The very considerable retarding effect of some *taungya* crops on the

growth of teak has been demonstrated, but it has been shown that this can be partly overcome by early stump planting. Storage of teak stumps up to three weeks, and their transport to distant places, have been proved feasible. It was again confirmed that in naturally light friable soil aeration in teak plantations by forking confers no advantage over cheaper weeding methods.

Contrary to some results from other parts of India it was again shown that sorting out of teak seed (fruits) by size is not justified, the germination and subsequent growth from large fruits being not appreciably better than from small. Further valuable confirmatory work on the best thickness, length of root, method of planting, etc., of stumps of teak and other important species was done.

Intensive research into the best methods and species to use for regenerating dry fuel forests was carried out and some definite recommendations can now be made as a result of these investigations. The feasibility of stump-planting sandal has again been shown.

The retarding effect of weeds in a teak plantation was very strikingly demonstrated, an increase of 165 per cent, in growth being obtained in 2 years in a clean weeded plot as compared with divisional weeding practice.

Extensive investigations into the best methods of regenerating tropical evergreen forests have been continued and some useful results obtained. A beginning in systematic research into thinning methods has been made with 27 plots at Nilambur and further sets are being laid out in Wynad division.

Spike disease research in sandal also now comes within the sphere of the silviculturist's activities, the most noteworthy result of the year being the successful experimental transmission of the disease on several occasions by insect vectors. The main problems that are being dealt with in this connection are the control of spike by removal of sources of masked infection, the isolation and breeding of resistant varieties of sandal, and the determination of immunising species of host plants with a view to their introduction in sandal bearing areas to reduce the incidence, and the isolation of the insect vectors of the disease with a view to their ultimate control.

(i) Natural Regeneration.

Experiments showed that a slight opening of the canopy over young natural regeneration of *Hopea parviflora* is beneficial.

Clearing under seed trees of *Hopea parviflora* was found to induce less natural regeneration than in the uncleared control areas.

Burning leaf litter under mother trees of *Artocarpus hirsuta* appears to increase the incidence of seedling regeneration.

Clearing undergrowth under *Swietenia macrophylla* mother trees does not appear to affect the incidence of seedling regeneration.

(ii) Seeds.

Seed pre-treatment.— Routine pre-treatment tests with cold, hot and boiling water were done with 19 species. Boiling water treatment improved the germinative capacity of *Acacia auriculiformis* and *Acacia cyanophylla* but was harmful for nearly all other species tried. The germinative capacity of *Pithecolobium dulce* and *Terminalia chebula* was definitely improved by treatment with hot water (as hot as the hand can bear). Soaking in cold water was beneficial in the cases of *Calophyllum elatum*, *Gluta travancorica*, *Pterocarpus santalinus* and *Xylia xylocarpa*.

Germination of *Cassia fistula* and *Cassia marginata* was greatly improved and hastened by soaking in concentrated sulphuric acid for 15 minutes and that of *Terminalia chebula* by soaking in cold water and then keeping moist in straw out of free air circulation.

(iii) Artificial Regeneration.

(a) Mixed Deciduous Timber Forest.

Comparison of direct sowing, entire transplanting and stump planting.— Previous year's results were confirmed and showed that for teak, *Dalbergia latifolia*, *Pterocarpus marsupium*, *Terminalia crenulata* and *Artocarpus hirsuta* stump planting is the best of the 3 methods while for *Xylia xylocarpa* direct sowing is to be preferred and for *Swietenia macrophylla* entire transplanting gives the best results.

Optimum season for stump planting.— Experiments were repeated and confirmed previous year's results. Last year had an abnormally prolonged and dry hot weather and early showers failed very badly in many places. In spite of this planting in the middle of April gave good results for teak, *Dalbergia*

latifolia and *Pterocarpus marsupium* and *Terminalia crenulata* showing that the risks of early stump planting due to a bad season are small (10–30 per cent.).

Stump planting—effect of diameter of stumps.— Teak stumps of 0.4"–0.8" diameter at the collum (—0.6"–0.9" diameter at the thickest part approximately) gave the best results.

In the case of *Dalbergia latifolia* stumps 0.2"–0.4" diameter at the collum and even larger appear to be best. For *Pterocarpus marsupium* results indicate that the large stumps even up to 1.0" diameter give the best results. For *Terminalia crenulata* stumps from 0.4"–0.8" diameter appear best and for *Artocarpus hirsuta* those of 0.4"–0.6" diameter.

Stump planting—effect of length of root—Teak.— Repetition of previous year's experiments confirm the indication that there is practically no difference in results from stumps of different root lengths within the range tried 4"–10".

Stump planting—comparison of pits and crowbar holes.— Repetitions of experiments confirmed the slight advantage of height growth due to 1" cube pits over crowbar holes but the difference is normally not likely to be worth the extra expense of digging pits.

Storage of stumps—Teak.— Experiments showed that stumps can be stored for 3 weeks before planting and still showed 70 per cent. survivals.

Transport of stumps—Teak.— Teak stumps from Nilambur were sent to 6 localities in different parts of the Presidency and in all 6 cases survived the journey. In 4 cases they are giving as good and better results than local stumps while in the other 2 cases they are not as good as the local stumps.

A repetition experiment showed that a *taungya* crop of *ragi* (*Eleusine coracana*) had a definite retarding effect on the height growth of a teak plantation of nearly 20 per cent. at the end of the first year. This retarding effect can be minimized by early planting the teak in the *taungya* as shown by another experiment in which, at the end of the first year, the teak in the *taungya* was 103 per cent. better in height growth and was still 85 per cent. better at the end of the second year.

(b) Dry Fuel forests.

During the year the new research centre at Emmanur in North Coimbatore has got into full swing and is beginning to give results.

Artificial regeneration of dry fuel forests by the "rab" method is being done on a larger scale each year in almost all divisions where this type of forest occurs and results are getting more encouraging as the technique improves.

In general, results indicate that (1) artificial regeneration by any method is best done at the beginning of the North East monsoon except possibly where watering is possible, (2) with most species entire transplanting is the best method of regeneration while with a few species direct sowing gives the best result, (3) stump planting is not a suitable method for this type of forest, (4) the following species may be regarded as "hopeful", *Acacia ferruginea*, *Acacia leucophloea*, *Albizia amara*, *Azadirachta indica*, *Holoptelea integrifolia*, *Prosopis juliflora*, *Soymida febrifuga* by entire transplanting and *Cassia siamea* and *Tamarindus indica* by direct sowing.

Experiments show that burning before such regeneration work is beneficial but that soil working during weeding and tending operations is not beneficial as although it gives in general a slightly better height growth yet casualties appear to be much greater.

Stump planting of sandal has been done very successfully in the last few years. Sandal plants up to 4 years old have been stumped and given 85 per cent. to 95 per cent. success.

(iv) Underplanting.

Burning in felling gaps in evergreen forest caused an average increase in height growth of 8 per cent. in the first year and 12 per cent. in the second year.

The general results of experiments of last year in underplanting in evergreen forest show that—

- (1) for most species transplanting is the best method of regeneration,
- (2) stump planting is not a suitable method for most evergreens,
- (3) weeding is worth while as it gives a slight gain in height growth and in percentage of survivals,
- (4) pitting for planting is also similarly worth while although the effects of the pitting do not show markedly until the second year when the roots and their requirements have both increased,

- (5) for most species July or early August appears to be the best month for transplanting, rather earlier for areas of light rainfall (60"-80") and later for areas of heavy South West Monsoon rainfall (120"-250"),
- (6) for most species the best size of transplants to use is from 8" to 1 foot high. Larger transplants occasionally do well but suffer very heavy casualties and are not definitely established for several years,
- (7) there is very little difference in results between nursery and natural forest seedlings,
- (8) basketing proved very successful in the case of *Dipterocarpus bourdillonii*,
- (9) burning before natural regeneration under evergreen cover appears to produce no beneficial effects,
- (10) application of repulsive agents does not decrease the browsing incidence.

— *Forest Research in India, 1934-35. Part II.*

International Year Book of Forestry Statistics 1933-35.

Volume I. Europe and U. S. S. R.

International Institute of Agriculture, Villa Umberto, I,

Rome 1936, pp. 327. Price : 25 lire.

For over ten years, the International Institute of Agriculture has been engaged in carrying out studies in the sphere of Forestry Statistics. The results of those studies appear in various publications. About three years ago the "International Yearbook of Forestry Statistics 1932" was published, containing statistical data for the forests in 52 countries in different Continents, together with the figures for the Trade in Wood in 18 countries in the Northern Hemisphere during the period 1925-1932.

As the statistical material available increased in size and in consequence its preparation required a considerable expenditure of time, the necessity for a publication in several volumes became manifest at the time of the preparation of the 2nd edition of the Yearbook. The first volume of the International Yearbook of Forestry Statistics 1933-35, which appeared recently and bears reference to Europe and to the U. S. S. R., represents in relation to the corresponding part of the Yearbook of 1932 alike a considerable development and a substantial improvement. The numerous detailed data on the Forests and the Timber Trade have been coordinated and grouped to form summary tables.

Taking in account the diversity of the material available, it was impossible that the different categories considered in the forest statistics could be identical for all countries. The data available, classified with all possible uniformity, refer to the area and composition of forest lands, the nature of ownership and treatment, the distribution of forests by species and by age, the growing stock of the forests, the annual increment, the production of wood and also to a number of other subjects.

In general, the latest available figures are used and, where possible, comparisons with earlier data are drawn. To facilitate a more detailed study, the sources utilised have been indicated precisely.

The Statistics of the Trade in Wood show the quantities of wood imported and exported during the period from 1930 to 1934, the different categories of wood, as also of certain wood

products, according to official sources of information. In the summary tables, which reflect the trade by categories and by countries, the figures available for 1935 are also given.

Preparation of the Statistics of the Timber Trade from the international standpoint has proved an extremely complex task, because of the diversity of the units of measurement employed. The metric system has been followed to secure the highest possible measure of comparability. The quantities imported and exported have been indicated in weight or in cubic metres and—as far as the official figures allow—both in weight and in cubic metres. For the summary tables in many cases the weight has been calculated on the basis of the indication in cubic metres and vice versa, when there have been sufficient elements available for the purpose. Similarly as regards a large part of the imports and exports of worked timber, the corresponding volume of round wood has also been calculated. In this manner and with the aid of the figures given in the Forest Statistics on wood production, the calculation of wood consumption in the different countries has been facilitated.

The text of the present volume, as in the case also of the 1932 Yearbook, is in French and in English. The second volume of the International Yearbook of Forestry Statistics 1933-35, which is now in course of preparation, will deal with the extra-European countries.

Notifications relating to Rangers.

20—4—37 :—

The following Rangers who were promoted on a temporary basis with reference to the orders in G. O. No. 818 Public (Services) Development, dated 22-5-1935, are confirmed on a permanent basis with effect from the 1st April 1937.

First Grade.

1. A. Ranganayakulu.
2. A. K. Kandan.

Second Grade.

1. H. Thammayya.
2. T. G. Sankaran Nair.
3. S. Sundaravaradacharya.

Third Grade.

1. A. K. Kunhunni Nair.
2. K. Shankaranarayana Rao.
3. S. G. Venkataramanan.

Fourth Grade.

1. K. Dooma Shetty.
2. M. P. Subbayya.
3. M. Narasinga Rao Naidu.
4. C. Vasu.
5. T. Koudathu Kavundan.

Fifth Grade.

1. P. Chengal Reddi.
2. A. R. Manuels.
3. P. V. Krishna Rao Naidu.
4. A. Vyasalu.
5. S. V. Nagalingam Pillai.
6. Abdul Khalak Sheriff.

Sixth Grade.

1. A. Niladri Rao.
2. T. M. Krishnamacharya.
3. R. Thangavelu Pillai.
4. P. K. Subbanarayana Ayyar.
5. V. Viraswami Naidu.

Seventh Grade.

1. P. Krishnan.
2. D. V. Nagarathnam.
3. V. Rangachari.
4. S. Rangamannar Doss.

20—4—37 :—

The following promotions of Rangers are ordered with effect from the 1st April 1937.

I.

Vice Ranger J. D. David, First Grade, retired from service:—

1. Mr. S. Ramachandra Ayyar, from Second Grade permanent to First Grade permanent.
2. Mr. K. Venkataramanan from Third Grade, permanent to Second Grade permanent.
3. Mr. Rao Sahib S. Rangaswami Ayyangar, from Fourth Grade permanent

to Third Grade permanent. 4. Mr. I. Sambasiva Rao Naidu, from Fifth Grade permanent to Fourth Grade permanent. 5. Mr. M. S. Krishnaswami Ayyar, from Fifth Grade Sub protem to Fifth Grade permanent. 6. Mr. P. Madhavan Nair from Sixth Grade permanent to Fifth Grade Sub portem.

II.

Vice Ranger M. Pakyanathan, First Grade, died :—

1. Mr. C. S. King, from Second Grade permanent to First Grade permanent.
2. Mr. Rao Sahib P. Sankunni Menon, from Third Grade permanent to Second Grade permanent.
3. Mr. B. H. Anandathirtha Rao from Fourth Grade permanent to Third Grade permanent.
4. Mr. S. Ratnavelu Mudaliar from Fifth Grade, permanent to Fourth Grade, permanent.
5. Mr. P. Madhavan Nair from Fifth Grade Sub protem to Fifth Grade permanent.
6. Mr. K. Raghuraman, from Sixth Grade, permanent to Fifth Grade Sub protem.

III.

Vice Ranger N. C. Mahadevan Pillai, Second Grade, invalidated.

1. Mr. K. C. Joseph, from Third Grade permanent to Second Grade permanent.
2. Mr. G. Appa Rao Naidu, from Fourth Grade permanent to Third Grade permanent.
3. Mr. B. Gulam Dastagiri from Fifth Grade permanent to Fourth Grade permanent.
4. Mr. K. Raghuraman, from Fifth Grade Sub protem to Fifth Grade permanent.
5. Mr. M. M. Mandanna from Sixth Grade permanent to Fifth Grade Sub protem.

IV.

Vice Ranger K. R. Krishnan Nair, Second Grade, invalidated.

1. Mr. R. Manickam Pillai from Third Grade permanent to Second Grade permanent.
2. Mr. P. A. Venkataraman from Fourth Grade permanent to Third Grade permanent.

V.

Vice Ranger R. Subrahmania Ayyar, Second Grade retired.

1. Mr. T. D. Ponnayya from Third Grade permanent to Second Grade permanent.
2. Mr. A. Surya Rao Naidu, from Fourth Grade permanent to Third Grade permanent.

VI.

Vice Range S. M. Krishnaswami Ayyar, Third Grade retired from service.

1. Mr. S. A. Dawson, from Fourth Grade permanent to Third Grade permanent.

VII.

Vice Ranger C. S. Ganapathy reduced from the Fifth to the Sixth Grade.

1. Mr. M. M. Mandanna from Fifth Grade Sub protem to Fifth Grade permanent. 2. Mr. P. A. Madhavan, from Sixth Grade permanent to Fifth Grade Sub portem.

VIII.

Vice Ranger S. G. Venkataraman Third Grade, deputed to the Vizianagaram Estate.

The promotions in this chain will take effect from the date of relief of Ranger S. G. Venkataraman which will be intimated later.

1. Mr. M. Rama Rao Kini from Fourth Grade, permanent to Third grade Sub protem. 3. Mr. B. Coates from Fifth grade permanent to Fourth grade sub protem. 3. Mr. N. Ayyanna, from Sixth grade permanent to Fifth grade sub protem. 4. V. N. Parthasarathy Naidu, from Seventh grade permanent to Sixth grade sub protem. 5. Mr. Gulab Singh, temporary Ranger, to Seventh grade sub protem. 6. Mr. T. R. Rajagopalan, acting Ranger to be temporary Ranger. 7. Mr. M. D'Souza, Trained Forester to act as Ranger, last grade.

IX.

In an existing vacancy of temporary Ranger.

1. Mr. C. Sreedhara Mannadiar, Trained Forester, to be temporary Ranger.

Waltair Circle.

- 13—3—37. Mr. P. Dhananjaya Rao, on expiry of leave to Narasapatam Range, Vizagapatam. 2. Mr. K. Subbanna, M. F. C. Trained Forester, to charge of Gudem Agency Range, Vizagapatam. The unexpired portion of leave granted to Mr. P. Dhananjaya Rao from 5-3-1237 to 19-3-1937 is cancelled.
- 24—3—37. Mr. Abdul Razack, Parlakimedi Maliahas Division, Orissa, to Gudem Agency Range, Vizagapatam Division *vice* Mr. K. Subbanna, trained Forester Fourth Grade. Mr. S. M. Ansur Ali, Ranger Seventh Grade, Ganjam Division, Orissa, is posted on special duty, Nellore.
- 30—3—37. On expiry of his leave on 1-4-37, Mr. P. Chengalreddy to Palakonda Range, Vizagapatam Division *vice* Mr. Ch. Rama-murthi,

- 1—4—37. Mr. Ch. Ramamurthi on relief of Palakonda Range charge by Mr. P. Chengalreddy, to special duty in Gudem Agency Range in the same Division.
- 3—4—37. Mr. I. Sambasivarao Naidu, Vizagapatam Division, on expiry of his leave on 16-4-1937 to Vinukonda Range, Guntur Division. 2. Mr. A. S. Kaunds, Forester First Grade in charge of Vinukonda Range, on relief by No. 1 will remain attached to Guntur Division.
- 3—4—37. Mr. M. Subbarao, Cherla Range, Godavari Upper Division to Rajahmundry Range, Godavari Lower Division. 2. Mr. Y. Vydyanatham, Rajahmundry Range, to Bhadrachalam Range, Godavari Upper Division. 3. Mr. P. Gopalam Bhadrachalam Range, on relief by No. 2 is transferred to charge of Cherla Range in the same division.
- 6—4—37. Mr. P. Chengalreddi, extension of leave for one month and 13 days from 1-4-1937 in continuation of the leave granted.
- 10—4—37. Mr. G. Apparao Naidu, on expiry of his leave, to River Range, Godavari Lower. 2. Mr. D. Krishnaswamiah, Ranger Fifth Grade, on relief by No. 1 to Repalle Range, Guntur District.

Bellary Circle.

- 19—3—37. Mr. T. M. Krishnamachari, Vempalli Range, Cuddapah North division leave for 3 months. 2. Mr. B. V. Nagaraja Ayyar, from Ganjam Division, Orissa Province, to Vempalli Range, Kurnool West division. 3. Mr. T. Balaramaswami Naidu, from Ganjam Division, Orissa Province to Sivapuram Range, Kurnool West division. 4. Mr. C. J. Nanjappa, Trained Forester and acting Ranger, Sivapuram Range, Kurnool West division on relief by No. (3) to revert to his permanent post as Forester, Cuddapah South division. 5. Mr. B. Krishna Rao, from Ootacamund Circle to special duty in Kurnool South division,
- 23—3—37. Mr. G. V. Subba Rao, Sirvel Range, Kurnool South division leave for four months with effect from 15-4-1937 prior to retirement.
- 10—4—37. Mr. C. J. Nanjappa, trained Forester and acting Ranger Sivapuram Range, on relief by Mr. T. Balaramaswami Nayudu to Sirval Range, Kurnool South division, *vice*, Mr. G. V. Subba Rao, granted leave.
- 16—4—37. Mr. B. V. Nagaraja Ayyar, under orders of transfer from Ganjam division, Orissa Province, to Vempalli Range Cuddapah North division, granted leave for three weeks from the date of his relief in Ganjam division.

Salem Circle.

- 1—4—37. Mr. B. V. Vaideeswara Ayyar, Tiruvannamalai Range, Vellore East division, leave for one month and 24 days from the date of relief.
- 1—4—37. Mr. T. N. Rajagopalan, Trained Forester, Coimbatore Circle to Tiruvannamalai Range, Vellore East division, to relieve Mr. B. V. Vaideeswara Ayyar proceeding on leave. 2. This cancels his posting to Turaiyur Range.
- 6—4—37. Mr. B. S. Ramaswami Ayyar, Polur Range, leave for 4 months from date of relief.

Coimbatore Circle.

- 20—2—37. Mr. A. M. Srinivasan, extension of leave for 2 months from 16-2-1937.
- 27—2—37. Mr. M. D. Pitchai Pillai, trained Forester and officiating Ranger, last grade, will continue to officiate as Ranger, last grade, *vice* Ranger A. M. Sreenivasan granted extension of leave for 2 months from 16-2-1937.
- 28—2—37. Mr. C. Thiruvengadam Pillai, extension of leave for 4 months with effect from 9-1-1937.
- 3—3—37. Mr. C. K. Unni, Ranger Seventh grade, Coimbatore division leave for 6 months and 2 days from 15-2-37.
- 7—3—37. Mr. T. R. Rajagopalan, Acting Ranger, Ulandi Range to join his appointment in Salem Circle.
- 9—3—37. Mr. T. D. Ponniah, leave for two months from date of relief from V. T. S. in Coimbatore South division.
- 23—3—37. On expiry of leave, Ranger Mr. I. John to be Assistant to Range Officer Tunacadavu Range. Acting Ranger Mr. M. D. Pitchai Pillai, on termination of the V. T. S. to proceed to Kollegal, for duty at the convenience of the District Forest Officer, Kollegal.
- 20—3—37. Mr. C. Thiruvengadam Pillai, Ranger Sixth grade, extension of leave for 6 months and 6 days with effect from 9-1-1937.
- 20—3—37. Mr. A. N. Ponniah, to the Ramapuram Range, Kollegal Division. 2. On relief by No. 1 Mr. V. Panchapakesan, acting Ranger will revert as Forester, Tinnevely Division.
- 6—4—37. The leave granted to Mr. T. D. Ponniah Ranger Third grade, for 2 months is cancelled. 2. On relief from the Vernacular Training School in Coimbatore South Division he is posted for duty in Tinnevely Division to any Range at District Forest Officer's convenience. Acting Ranger Mr. M. D. Pitchai Pillai, to Ramapuram Range. He should relieve Acting Ranger V. Panchapakesa Ayyar and hold

charge of the Range till Ranger A. N. Ponniah joins here from Ootacamund Circle. 2. Mr. V. Panchapakesa Ayyar, Acting Ranger will, on relief by No. 1 revert to his permanent post as Forester and proceed to Tinnevely forthwith.

- 14—4—37. Mr. S. Venkatarama Ayyar, Bargur Range, Kollegal division, leave for 3 months from date of relief. He is permitted to draw conveyance allowance of Rs. 15/- a month during the period of his leave. 2. Mr. M. D. Pitchai Pillai, acting Ranger, on relief in Ramapuram Range by Ranger A. N. Ponniah Pillai, to Bargur Range is relief of Ranger S. Venkatarama Ayyar.

Ootacamund Circle.

- 30—1—37. Mr. A. N. Ponniah, extension of leave for two months from 10th February 1936.
- 26—2—37. Mr. K. K. Appiah, Coondapur Range, to hold additional charge of Shankaranarayana Range, in relief of Mr. B. Krishna Rao, recommended leave, till relieved by No. 2. 2. Mr. C. J. Muthanna, Trained Forester, in charge of Sigur on relief by Mr. Coates to Shankaranarayana Range, Mangalore North Division, in relief of No. 1.
- 4—3—27. Mr. K. P. Chathu Nair, Wynaad, granted leave for two months from 10th April 1937.
- 6—3—37. Mr. A. N. Ponniah, on return from leave to Beypore Depot, Nilambur Division. 2. Mr. K. Subaraya Ayyar, to Uppinangady Range, Mangalore South Division. 3. Mr. C. Vasu Uppinangady Range to Puttur Range.
- 6—3—36. Mr. T. Perumal Gownder, to Nilambur Division for special duty.
- 8—3—37. Mr. B. Krishna Rao, Shankaranarayana Range, leave for 45 days from 27-2-37.
- 11—3—37. Consequent upon Mr. K. Sankaranarayana Rao having been injured in an accident, acting Ranger K. M. Achayya is posted to take charge of Coonoor Range from the District Forest Officer temporarily in charge.
- 26—3—37. 1. Mr. D. E. Lewin, special duty in Nilambur Division. 2. Mr. C. S. Ganapathy, special duty (Survey work) in Mudumalai Range, the Nilgiris Division. 3. Mr. G. Rama Rao, to Shankaranarayana Range, in relief of Trained Forester C. J. Muthanna, who will revert to Nilambur.
- 6—4—37. Mr. T. Perumal Gownder, Ranger Sixth grade, on return from leave is temporarily posted for Special Duty in Palghat Division.
- 7—4—37. Consequent on the transfer of Ranger Mr. A. N. Ponniah to Coimbatore Circle, the transfers of Messrs. K. Subbaraya Ayyar, and C. Vasu, ordered on 6th March 1937 are kept in abeyance until further orders.

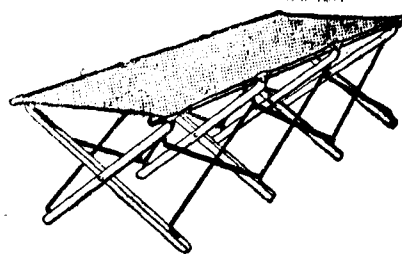
- 8—4—37. K. Sankaranarayana Rao, Coonoor Range, granted leave from 9th March 1937 to 24th April 1937. On the expiry of the leave he will resume charge of the Coonoor Range. 2. Trained Forester K. M. Achayya will revert to Nilambur Division on relief by No. 1.
- 11—4—37. Mr. K. P. Chathu Nair, on expiry of his leave to boundary verification work in Wynaad Division.

Corrigenda.

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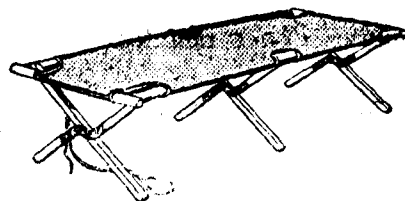
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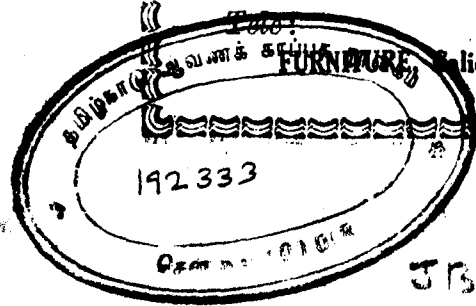
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