Vol. XXII. SEP. & DEC. 1937. Nos. 1 & 2

THE MADRAS
Forest College Magazine.

EDITED AT COIMBATORE.
MADRAS PRESIDENCY

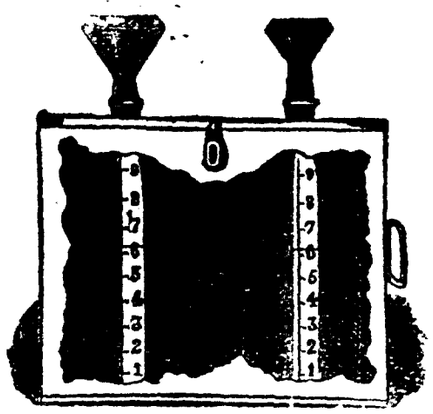
Published by the Principal,

MADRAS FOREST COLLEGE.

PRINTED BY S. VINCENT AT THE ELECTRIC PRINTING WORKS,
COIMBATORE

ORR'S RAIN GAUGES.

MADE IN BEST QUALITY BLOCK TIN; ENAMELLED BLACK.

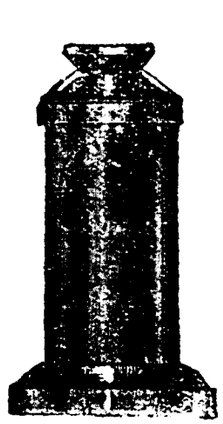


S. 200 — Differential Rain Gauge by C. Michie Smith, block tin case, brass funnels. Both bottles have etched figures. Complete with measure and instructions.

Rs. 45 nett

S. 202 — Government Pattern Rain Gauge; single bottle, complete with measure and instructions.

Rs. 18 nett



SPARE COMPONENT PARTS FOR THESE GAUGES:—

Measuring Glass Divided in ozs. to 12 ozs. for S. 202 — **Rs. 5.**

Measuring Glass Divided to 1" in 1/100" for S. 200 — **Rs 7-3-0.**

Graduated bottles S. 200—**Rs. 5.**

Ungraduated „ S. 202—**Rs. 3.**

IMPORTANT NOTICE: Rain gauges of all types and prices, whether imported or manufactured in our own uptodate workshops can always be supplied together with spare parts.

— P. ORR & SONS, LTD., —

Imperial Works, MADRAS.

Specialists in Surveying & Drawing Office Equipment.

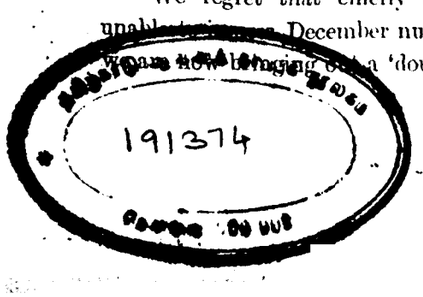
The Madras Forest College Magazine.

Vol. XXII. **Sep. & Dec. 1937.** **Nos. 1 and 2**

CONTENTS.

—:o:—

We regret that chiefly due to want of "copy", we were unable to issue December number at the proper time. Instead we are now bringing out a 'double' number. — *Ed.*



THE
Madras Forest College Magazine.

Vol. XXII. SEP. and DEC. 1937. Nos. 1 & 2.

WILD LIFE AROUND THE COLLEGE AND THE COLLEGE CAMPS.

By, A. G. W. D'Silva. *(M. F. C., 1936–38 Dn.)*

[*Winning essay for Chief Conservator's prize for the best essay on Natural History.*]

—:o:—

"He prayeth well who loveth well
Both man and bird and beast"

— *Coleridge.*

Just at the present time there is a great deal of public interest in the conservation of wild life all the world over.

Countries where industrialism and agriculture have denuded the forest — the natural home of birds and beasts — have realised, perhaps too late, that some of Nature's greatest gifts to beautify and cheer a landscape are lost for ever; and every endeavour is now being made to preserve animal and bird life in natural conditions by forming National Parks and Sanctuaries.

Up to recent times birds and beasts were looked upon as either "warm storage" of Nature for man to draw upon for a change of diet, or a vagary of creation to annoy him. The important part that birds play in the economic and agricultural welfare of a country by being scavengers and a check on the spread of insect pests and thereby maintaining a balance of nature, was also not fully realized.

To us Forest officers, who spend our lives in wooded areas, a knowledge of the bird life in our forests is essential. Besides, it forms part of the public trust placed in us; and posterity will accuse us, if we do not safeguard a heritage of Nature which cannot be replaced once it is lost.

Anyone can derive a thrill or inward joy at the sight of a bird either love-lorn or with the joy and exuberance of life singing an inimitable lay to his mate.

I shall try to give an account of some of the birds commonly met with in our College estate and in our Camps.

The former is about 200 acres but does not contain many fruit trees to attract birds. First come our pugnacious partridges, introduced some years ago. How noisy they are, splitting the air with their cry at early morn and sometimes all day! A few Bulbuls, rather shy, can be seen and heard chirping around the leafy bushes. Unmistakable chocolate coloured Mynas, sometimes a single pair, or three or four feed on the insects and worms on the ground, and at the sight of anyone approaching fly to the nearest tree with a twitter, exposing their partially white feathers, only to alight on the ground when the danger is past. Another common feeder on the ground is the beautiful crested Hoopoo, often seen in pairs digging the ground for tiny worms with its long beak; the crest is of light brown feathers making an appropriate crown for the black and white striped breast. They nest freely in the eaves of the dining and bathrooms of the students' hostel blocks and this is strange, for, they are migratory birds; the parents can be seen busy in the

compound foraging for the babies or giving the fledglings lessons in flying. They are almost semi-tame and if not rudely scared can be approached quite near. The Drongo or King Crow with its shining black coat and forked tail can be seen squatting on a leafless branch or electric post quite composed, and makes an occasional sweep on an unwary insect, when you can hear the click of his beak quite plainly. His favourite hours are early morning and dusk; he also wages an occasional war by flying at the Crow who is his sworn enemy, but I think this is only during the nesting season.

The owlets seem to have a lease or monopoly over the estate and can be seen at dusk on the roofs and continue to screech almost till morning, and are at times a perfect nuisance; sometimes young ones are left stranded in the hostel blocks but neither they nor their parents seem to mind it as they are safe from the wicked Crows. Another inhabitant of the hostel blocks is the ordinary house sparrow who constantly chirps and keeps on carrying bits of grass for nest building. The blue Jay who resembles a large King Fisher and makes graceful sweeps and "freewheels" for long distances can be seen of an evening close to the athletic grounds. The last member worthy of note is the ubiquitous Crow of whom the least said the better.

The following are the commoner birds met with in **Sadivayal and Walayar** camps. The Golden Oriole with its beautiful gold and black feathers seen mostly in the mornings and evenings; this species is migratory — only to be seen at certain times of the year. Ash Doves usually feeding in pairs in fields or open land and resting on leafless boughs — the grey Jungle cock, with his brilliant hackle and sharp spurs and his unmistakable crowing heard early in the morning or towards sunset. The hen is brown in colour and has a more natural camouflage and is less readily discernible; the Jungle Babblers commonly known as the "Seven Sisters" rather dirty in colour and unprepossessing in appearance, are always found in numbers

and can be seen hopping about, or giving a metallic note in unison with the vibrating wings. They are no good as long distance or high flyers. The Green Barbet is rather difficult to locate among the foliage, but can be made out by its cry and extra big triangular beak. The Sparrow Hawk, lynx eyed and ever ready to pounce on an unwary fledgling, from an invisible cover, occasionally makes an unsuccessful sweep. The Crow Pheasant very destructive to eggs & young of birds, is usually found in bushes, with its red wings and large eyes and prominent curved beak specially suited for digging out the delicious and juicy snails from their shells. Varieties of Hawks and Kites are met with at times flying rather low to spot a nest, or a hare, or even a snake; one comes across Vultures feeding on carrion or bleaching bones on tank beds or other open places. Flights of parroqueets often whizz past you in mid-air and disappear among the green foliage; no nut or fruit is hard enough to withstand their sharp beaks. The jarring note of the Night Jar is heard at dusk, or you can see him squatting on a road or path only to fly off at your nearer approach.

Of all the camps visited by the Forest College, **Nedungayam** in S. Malabar seems to have the most abundant bird life, in spite of the fact that very large areas are under Teak. This may be due to the fact that there is more undergrowth and insect life in that humid climate, and the large unfelled natural sub-mountainous forest. In addition to most of the varieties detailed above, there are Honey Suckers, Bee Eaters and long-tailed Birds of Paradise. Green Pigeons with purplish and yellow outer wings can be heard whistling on trees by the banks of the stream, and the coo of the Imperial Pigeon penetrates from the dizzy heights of the forest trees. Hill Mynas with their shining black feathers and large yellow ears are common in the Teak plantations. Gorgeously coloured King Fishers, Egrets and Wag-tails can be seen on the river banks and branches over-hanging the water, ready to victimise a surface minnow. There are wood peckers of different kinds to be seen.

In the evenings flights of Swifts used to whizz past us while bathing, skimming the surface of the water either as an exercise or for drinking. A *Ficus* branch by the side of the bridge opposite the camp was a favourite resting place of Turtle Doves and Green Pigeons every evening. The Spur Fowl with its beautiful shell mottled feathers and red feet and ever heightening note was heard in the early mornings in the natural forests, but was seldom or never seen by us. The Hornbill with its long tail and big beak and note resembling a clogged motor horn glides gracefully from tree to tree in the natural forests.

At **Bangalore** there were Water Crows, Herons, Wild Duck and Whistling Teal in the Ulsoor Tank. They enjoy rigid protection and are not one bit shy.

Bird life around **Kargudy and Aiyur** Camps except for Jungle Fowl and some Doves and Pigeons, was scarce as it was a very dry time of the year and the trees were all inhospitable. A solitary Horned Owl sometimes breaks the silence of the night with its monotonous and ominous hooting cry.

In the **Coonoor and Ooty** Camps too, bird life was rather scarce as the large areas under *Eucalyptus* and other exotic species afforded no food and poor shelter; in addition the cold was severe and the wind very strong. Sometimes a Jungle Fowl was heard. The hills are reputed to harbour the Lark which I have not been fortunate enough to see or hear.

These are some of the birds I have seen and which any student is likely to meet; I dare say they form only a fraction of the ones actually to be found.

COLLEGE NOTES.

I. Cricket:

Y. M. C. A. Cricket Tournament (Rhoady shield), 1937.

[*Forest College* V. *Madras Agricultural Students' Union, August 28th. 1937: lost by 65 runs (and 6 wickets);-*]

We regarded this match as being decisive for the Tournament; if we won we had every chance to come out top. But we had not reckoned on meeting C. Ramaswami the Test player, and C. N. Babu who is a very good bat both of whom became eligible to play since the rules regarding qualification were altered in 1937. The Forest College batted first and compiled a total of 121, Holkar being top scorer with 40 which included 5 fours. C. Ramaswami opened the bowling, and he was employed to break up several promising stands. He took 4 for 24. The Agriculturists opened with H. Shiva Rao and C. N. Babu, and they put up 71 for the first wicket, both playing very well. This let in C. Ramaswami who laid about him very freely, and made 24 in 8 hits before Holkar got him caught, the score being 108 for 2 wickets. The match now was virtually over, when the first Agricultural College student came on view, but he was bowled by Rodrigues for 1. C. N. Babu went on to complete an excellent century, and was not out at the close.

Forest College.

S. M. Wagle	l. b. w., b. Ramaswami	8
V. B. Koppikar	c. Shivarao b. Dinkerrao	0
S. H. Bagot	b. Dinkerrao	21
A. A. Khan	c. Ramasawmi b. Raman	10
J. H. Longrigg	b. Thomas	8
L. H. Rodrigues	c. Shivarao b. Raman	0
V. S. Holkar (Capt)	b. Ramasawmi	40
P. Indersen	b. Ramasawmi	21
S. R.Umbarjee.	b. Dinkerrao	5
Md. Ibrahim Ali.	c. Shivarao b. Ramasawmi	1
A. A. Golandaz.	not out	0
Extras		7
	Total	121

M. A. S. U.

C. N. Babu	not out	100
H. Shiva Rao.	c. Khan b. Rodrigues	19
C. Ramaswami	c. Indersen b. Holkar.	24
K. Raman.	b. Rodrigues.	1
Nagaraja Rao.	b. Holkar	19
Varadarajan	not out.	0
Dinker Rao (Capt.)	did not bat.	
K. Thomas		
Shetty		
Nataraj Rao		
Hegde		
Extras		23
	Total.	186 for 4 wickets.

Bowling	Overs.	Runs.	Wickets.
L. H. Rodrigues.	12	57	2
V. B. Koppikar.	16	37	...
V. Holkar.	17	42	2
S. H. Bagot	2	5	...
A. A. Golandaz.	5	22	...

Tournament: Forest College V. The Scouts Recreation Club:

October 4th. 1937. Won by 73 runs.

We batted first and Mr. Khan laid the foundations by defending stoutly for about 40 minutes. He included 12 singles in his invaluable 23. Nobody stayed with him long, but later our captain Holkar (55) hit freely, and was ably assisted by S. R. Umbarje, who made 24. The innings closed for 164. The Scouts captain tried 7 bowlers of whom C. V. Subramanian had the good figures of 5 for 30 in 16 overs.

The Scouts XI had 3 men out for 8 runs. They never looked like getting the necessary runs and were all out for 91. Shaikh bowled best for us getting 4 for 24.

Forest College:

A. A. Khan	b. Muthusawmi	23
S. M. Wagle.	c. Subramanian.	2
S. H. Bagot hit wicket.	b. Subramanian.	9
V. B. Koppikar	b. Gopalachari.	7
L. H. Rodrigues.	b. Balakrishnan.	10
V. S. Holkar (Capt.)	b. Subramanian	55
P. Indersen	c. Ranganathan b. M'sami	7
S. R. Umbarje	b. Subramanian	24
A. A. Golandaz	b. Gopalachari	0
Md. Ibrahim Ali	not out.	7
H. I. Shaikh	b. Subramanian	5
Extras		15
	Total.	**164**

Scouts:

Ramanathan	l. b. w., b. Koppikar	1
C. M. M. Rao.	b. Shaikh	0
C. G. K. Murti	c. Koppikar v. Shaikh	4
Muthusawmi	b. Holkar	9
K. S. Ramu	c. Shaikh b. Koppikar	29
C. V. Subramanian	b. Holkar	2
Rajarám	b. Shaikh	7
T. B. Gopalachari	b. Shaikh	18
Ranganathan hit wicket	b. Holkar	2
P. S. Balkrishnan	b. Rodrigues	18
Rangarajan	not out	0
Extras		1
	Total	91

Bowlers.	Overs	Runs.	Wickets.
H. I. Shaikh.	13	24	4
V. S. Holkar.	11	40	3
V. B. Koppikar	9	20	2
L. H. Rodrigues.	10	6	1

Tournament: Forest College v. Stanes High School, Coimbatore.

October 9th, 1937 : lost by 3 runs.

Played on their ground and resulted in a very close game all through, and an exciting finish. The College fielded an XI of students, while Stanes played one member of their staff, Mr. Fowler. Scoring ruled very low. The Forest College batted first but no stand was made and the side was out for 63, A. A. Golandaz being top scorer with 16 not out.

Mr. Fowler took 5 wickets for 36 and A. Keir took 5 for 22. Stanes did even worse, being out for 56 of which Mr. Fowler made 19. Our new fast bowler H. I. Shaikh had the remarkable figures of 5 wickets for 14 runs. After playing one innings each it looked very unlikely that the School could win but in our second innings no one could play Keir's bowling. He had 9 for 12. Probably nerves had a good deal to do with the collapse. In the last innings the boys made 52 and just got home by 3 runs. Our captain V. S. Holkar had good bowling figures in both innings. He figured also when batting, in a curious incident which shows the inexperience of the umpires. There was an appeal against him for a catch at the wicket and he really had touched the ball and ought to have been out as he told us afterwards. But the umpire at the bowler's end thought otherwise and said "not out". Thereupon the square leg umpire walked to the bowler's end and said something to his colleague who then revised his decision and said Holkar was out, so out he went. The point is that the umpire should not change his order after a lapse of several minutes. He should stick to his first decision even if, as in this case, it was wrong.

Forest College:

		1st innings.		*2nd innings.*	
S. M. Wagle	b. Fowler	9	c. and b. Keir	6
V. B. Koppikar	b. Keir	11	b. Keir	4
S. H. Bagot	l. b. w., b. Keir	2	Stumped...b. Keir	0
L. H. Rodrigues	c. Bird b. Fowler	6	b. Keir	14
V. S. Holkar (Capt)	l. b. w., b. Fowler	2	c.....b. Keir	0
P. Indersen	c. and b. Fowler	4	b. Keir.	3
S. R. Umbarje	b. Fowler	0	b. Keir.	0
A. A. Golandaz	not out	16	b. Keir	3
Md. Ibrhim Ali	c. Bird b. Keir	7	c. Bird b. Keir	6
H. I. Shaikh	Stumped—b. Keir	3	b. Bird	0
S. Seshagiri Rao Nayudu	c. Bird b. Keir	0	not out	2
Extras		3		4
	Total.	63		42

Bowling	1st innings.			2nd innings.		
	Overs.	Runs.	Wickets	Overs.	Runs.	Wickets.
A. Keir	10	22	5	10	12	9
Mr. Fowler	10	36	5	2	8	nil
S. Bird	5	1	nil.	7	18	1

Stanes' School:

	1st innings.		*2nd innings.*	
Mr. Fowler	St. Bagot b. Koppikar	19	c. Umbarje, b. Shaikh	9
S. Bird	c. Rodrigues b. Shaikh.	0	c. and b. Shaikh	7
A. Keir	b. Shaikh	5	St. Bagot b. Holkar	7
G. Pitcher	run out	1	c. Indersen b. Holkar	1
D. Rozier	c. Naidu b. Shaikh	8	b. Shaikh	10
A. Saville	c. Naidu b. Shaikh	15	c. Ali b. Holkar	0
D. Aldridge	not out	1	run out	0
A. Pitcher	b. Shaikh	0	St. Bagot b. Holkar	7
T. Grant	b. Holkar	2	b. Shaikh	1
N. Bird	l. b. w., b. Holkar	4	c. Holkar b. Shaikh	5
R. Johnson	St. Bagot b. Holkar	0	not out	3
Extras		1		2
	Total.	56		52

Bowling.	1st innings.			2nd innings.		
	Overs.	Runs.	Wickets	Overs.	Runs.	Wickets
Shaikh	12	14	5	11	28	5
Holkar	5	17	3	10	22	4
Koppikar	7	9	1	did not bowl.		
Rodrigues	6	15	nil.	,,		

Forest College V. Madras Agricultural Students' Union.

January 13th 1938: Won by 30 runs.

This was a friendly played on our ground. The union were below full strength as their Test Cricketer C. Ramaswami was away in Madras playing in the Presidency Match and Messrs. H. Shiva Rao and K. M. Thomas stood down. Except for C. N. Babu they fielded a team of College students and even so they were short of 4 or 5 of their best student cricketers who were in camp. The Forest College was at full strength except for Mr. A. A. Khan. The Junior student F. B. Nazereth came into the side for the first time, having recovered from a serious illness. He promises well both with ball and bat. Holkar lost the toss but our opponents unaccountably put us into bat which we gladly did from 11.25 A. M. until 3.25 P. M. (3 hours actual play). Then Holkar declared the innings closed and put the other side in to bat for half an hour before the tea interval. He set them to make 135 runs with 2 hours and 10 minutes to do it in The Forest College batting was painfully slow. The first wicket fell at 3, then the Principal stayed for twenty minutes to make 1 and S. M. Wagle had 13 singles and 3 two's to make up his score of 19. No doubt all this had value in tiring the field but one looks for more enterprise in a friendly. V. B. Koppikar had only one 4 in his 50 not out but he batted extremely well in his steady reliable fashion (and he did not run anybody out. In fact no one was run out). F. B. Nazareth has a nice stance at the wicket but he appeared to let off a number of loose balls outside the leg stump. Mr. Extras

made a very useful contribution to our score. In the end we reached 134 for 8 wickets. In the half hour before tea we hoped for some quick wickets, but we only got one, Dass being, l. b. w. for 2 a minute or two before 4 O'clock with the score at 13. After tea Kothandaraman (37) and S. N. Babu (32) batted briskly, the former having 5 fours and the latter 2 fours and 2 threes. Both were dropped several times, besides one or two which did not go to hand, but they pushed the score along, and when it stood at 78 with only 3 men out it looked as if they might win the game. After they left, play became very slow, with the Forest College having the game well in hand, but the last man was caught only 3 minutes before time (6 O'clock). Holkar has a lot of bowlers at his command. He called on 6 (including himself) and although none was deadly all did well, Shaikh's fast stuff being perhaps the best. The College team is very short of practice.

Forest College :

S. M. Wagle.	b. Kothandaraman	19
S. R. Umbarje	b. Mukundan	0
J. H. Longrigg	c. Hegde b. Mukundan	1
V. B. Koppikar.	Not out	50
S. H. Bagot	b. Mukundan	0
L. H. Bodrigues.	b. Kothandaraman	0
V. S. Holkar (Capt)	c. Viswanathan b. Hegde	26
P. Indersen	b. Santhanam	3
F. B. Nazareth	b. Kothandaraman	17
A. A. Golandaz H. I. Shaikh.	did not bat	
Extras		18
Total for 8 wickets dec.		134

Bowling	Overs.	Runs.	Wickets.
Mukundan	17	32	3
Hegde	24	41	1
Kothandaraman	9	21	3
Santhanam	2	11	1

M. A. S. Union.

Nayanar.	c. Nazareth b. Shaikh.	9
Dass	l. b. w., b. Golandaz.	2
Kothandaraman	b. Holkar.	37
Ramasawmi	c. Koppikar b. Shaikh.	0
C. N. Babu.	c Holkar. b. Rodrigues.	32
Mukundan. hit wicket	b. Holkar.	1
Hegde	l. b. w., b. Rodrigues	0
Shaikh Hussain	b. Shaikh	3
Santhanam	not out	6
Visvanathan	b. Shaikh	0
Somanna	c. Longrigg c. Holkar.	7
Extras		7
	Total	104

Bowling	Overs.	Runs.	Wickets.
Shaikh	14	23	4
Holkar	11	28	3
Rodrigues	7	12	2
Golandaz	3	11	1
Koppikar	8	11	Nil
Nazareth	8	12	Nil

II. Athletic Sports, 1937.

The College Sports were held for the 25th year in succession on Wednesday morning, October 20th at 8-30 A. M , (Heats), and Saturday afternoon October 23rd at 2-30 P. M., (Finals), and not a sign of rain. All the events drew enough entries, and the racing and the field events were interesting all through. Saturday was a lovely day, out there on our athletic grounds, with the hills, Lambton's Peak and the rest, looking their best but it was rather hot. We had erected a wonderful array of tentage so as to give all the guests a sit down tea under shade. They were fewer guests than usual as many officers were in camp and the English Club had a Tennis tournament on the same afternoon and the Agricultural College had a cricket match. The tables were gay with cut flowers, besides the usual display of ferns and cortons in pots, and there was lots of room

for everyone. The champion athlete was A. Olimuthu who won the quarter-mile and high jump, and took second place in the 100 yards, and in the long jump, and was third in the 120 yards hurdles, totalling 17 points. This made him one point ahead of J. P. D'Cunha of the 1937-39 Division (16 points), who won the 100 yards and the long jump and gained 3 third places. Next in order came S. H. Bagot (13 points), he having won the hurdles and the Javelin throw.

The open half mile race attracted 4 pairs from outside, making an entry of 10 runners, and was won by C. Muhammad Batcha of the Municipal High School in 2 minutes 13 seconds. He is the record holder at the Coimbatore Olympics at this distance, with his time of 2' 10" in 1936. The best performance of the day was D'Cunha's 10-3/5 seconds for the 100 yards (equals College record) as he was not pressed. The sackscrimmage was a joy as usual. It was won by Madras students. The Relay race was won by Bombay rather easily. The 2 miles cycle race (not 20 miles as the programme said) was won by A. A. Golandaz after a good race with P. Indersen who came second.

Punctually at 6 P. M. Mrs. H. P. Ward kindly gave away the prizes and was heartily cheered at the finish.

The results of the more important events are given below :-

I.	*Shot Put:* *(16 lbs)*	1. I. A. Fernandez 2. K. K. Somayya. 3. J. P. D'Cunha.	...	27' 6¼"
II.	*High Jump:*	... 1. A. Olimuthu 2. S. H. Bagot. 3. V. S. Holkar.	...	4'10½"
III.	*100 Yards:*	... 1. J. P. D'Cunha 2. A. Olimuthu. 3. V. S. Holkar.	...	10 3/5 Sec.
IV.	*Quarter Mile:*	... 1. A. Olimuthu 2. V. S. Holkar. 3. A. A. Golandaz.	...	61 Secs.

V.	*Open half mile:*	1. C. Muhammad Batcha 2m.–13 Sec. (Municipal High School) 2. D. Rozier (Stanes High School.)		
VI.	*120 Yards hurdles:*	1. S. H. Bagot 2. J. P. D'Cunha. 3. A. Olimuthu.	...	20 1/5 Sec.
VII.	*Long Jump:*	1. J. P. D'Cunha 2. A. Olimuthu. 3. V. S. Holkar.	...	16ft. 8 inch.
VIII.	*Sack Scrimmage:*	Won by Madras students. 1. S. Seshagiri Rao Naidu. 2. A. Olimuthu. 3. G. M. A. Khuraishy. 4. I. A. Fernandez.		
IX.	*One Mile:*	1. L. C. Baktani. 2. K. K. Somayya. 3. A. A. Golandaz.	...	5 Min. 52 4/5 sec.
X.	*Javelin throw:*	1. S. H. Bagot 2. S. R. Umbarje. 3. J. P. D'Cunha.	...	107' 7"
XI.	*Relay Race:*	Won by Bombay students. 1. S. R. Umbarje. 2. H. I. Shaik. 3. A. A. Golandaz. 4. J. P. D'Cunha.		
XII.	*Discus throw:*	1. A. A. Memon 2. G. N. Mansukhani. 3. A. A. Golandaz.	...	75'–6"
XIII.	*Cycle race:* *(2 Miles.)*	1. A. A. Golandaz. 2. P. Indersen. 3. J. P. D'Cunha.		

III. Sixth Olympic Sports meeting 1937.

This was held at the Stadium, Coimbatore, on November 5 & 7, 1937 and was splendidly organised by Rao Bahadur Dr. T. A. Raja. Dr. G. F. Andrews came down from Madras to judge. The meeting was open to athletes from Coimbatore, Nilgiris, Salem, Madura, Trichy, Malabar, and South Kanara (with a population of say, 12 millions of people). The Olympic Aggregate Cup has been won as follows in previous years:—

1933. Government College, Coimbatore.

1934. (February) Reserve Police, Coimbatore.

1934. (November) Agricultural College, Coimbatore.

1935. 1st Bn. King's Own Royal Regiment, Wellington, Nilgiris.

1936. 1st Bn. King's Own Royal Regiment, Wellington, Nilgiris.

The Olympic Medal has been won by:—

1933. P. Bennett Masilamani, Agricultural College, Coimbatore.

1934. (February) S. John Joseph, Reserve Police, Coimbatore.

1934. (November) M. Kolandaiswamy, Periakodiveri, Coimbatore Dt.

1935. T. J. Abraham, Forest College, Coimbatore.

1936. Bds. L. Coblenz, 1st Bn. King's Royal Regiment, Wellington, Nilgiris.

This year the forest College entered the following team:—

1. S. H. Bagot.
2. A. Olimuthu.
3. J. P. D'Cunha.
4. I. A. Fernandez.
5. L. C. Baktani.
6. G. N. Mansukhani.
7. A. A. Menon.
8. A. A. Golandez.
9. P. Indersen.

As it happened none of our men got a place, but D'Cunha was in the 100 yards final, Olimuthu was prominent in the 120 yards hurdles, Bagot threw 110 feet in the Javelin, our cyclists put a good show (A. A. Golandez was fouled) and in the Half-mile relay we were well placed with our third man V. S. Holkar running second and going very fast when he shot across the track and was out of the race.

Some of the winning times, etc. were as follows:—

Shot put 33 ft.; 100 yards dash 10 4/5" (against a wind); High jump 5ft. 6 5/8 inches; Half mile 2' 7"; Quarter Mile 53 4/5"; One mile 4' 54".

IV. New Students: (1937—1939 Division) :—

We extend our welcome to the new comers to the College, who are fifteen strong. The following is a list of them :—

Serial No.	Name of student.	Province or State
1.	V. D. Mehendale, B. Sc.	Bombay.
2.	J. P. D'Cunha.	"
3.	F. B. Nazareth.	"
4.	H. I. Shaikh	"
5.	S. H. Korlhalli B. Sc.	"
6.	S. V. Halbhavi.	"
7.	N. A. N. Khan.	Sind.
8.	L. Baktani.	"
9.	N. M. Fernando.	Ceylon.
10.	P. W. Rutnam.	"
11.	K. K. Somayya.	Coorg.
12.	S. Ramakrishnan Nair, B. A.	Travancore (private)
13.	R. Neelakantan Nair.	"
14.	Md. Ibrahim Ali.	Hyderabad.
15.	N. G. Dacha.	"

V. Swimming.

The annual race for a silver medal was held on December 16th, in the Karimpoya river at Nedungayam camp, South Malabar, as usual. The distance was a measured 100 yards, instead of 140 yards as in previous years. The reason given was "to attract more entries". There were 7 starters and they finished the course in the following order:—

1. S. H. Bagot. (Ceylon) winner.
2. S. R. Umbarje (Bombay)
3. S. M. Wagle (Bombay)
4. K. Andiappan (Madras)
5. V. B. Koppikar (Bombay)
6. Bhagat Singh (Indore)
7. C. Varadarajulu (Madras)

Two students, both strong swimmers, were sick on the day of the race, namely, A. Olimuthu (Madras) and A.A. Memon (Sind); otherwise they certainly would have raced.

When the race was over, eleven other students were despatched over the same course, of whom nine duly arrived at the finishing tape in the following order :—

10. I. A. Fernandez (Madras)
11. V. S. Holkar (Indore)
12. S. D. Misra (Indore)
15. K. Narayanamoorthi (Travancore)
16. G. N. Mansukhani (Sind)
17. S. Seshagiri Rao Nayudu (Madras)
18. P. H. Uttam Singh (Sind).

That leaves a residue of 8 men who did not swim the course, nor pass the prescribed swimming test which is to swim across the Karimpoya river :—

19—26 E. Jacob (Madras).
K. N. Raghavachary (Madras)
G. M. A. Khuraishy (Madras)
B. C. Pal. (Madras)
A. A. Golandaz. (Bombay)
M. F. Hussaini (Hyderabad)
P. Perera (Ceylon)
S. Saran Lal. (Orchha)

VI. Marathon Race. 1938.

The annual cross-country race, over a course of 7 miles exactly (most of it is on the road) for the Moopil Nair Cup (individual winner) and the Inter-Divisional Cup (team result) was run off on Saturday, March 5th. soon after 6-30 A.M. Both the start and the finish were at the Cricket pavilion as usual. The following 8 students were non-starters being unfit:- K. N. Raghavachari, A.A. Memon, Md. F. Hussaini, V.S. Holkar, F.B, Nazareth, L.R.B. Baktani, X. M. Fernando, and R. Ramakrishnan Nair. 33 men started and all finished.

S.V. Halbhavi led at the start, but at the first control, 2½ miles from the start V.B. Koppikar was leading by a few yards from K.K. Somayya with A. Olimuthu running third. Olimuthu (Madras) who has his eye on the Pentland Shield, took the lead before 5 miles and went on to win by 120 yards from Somayya in the creditable time of 44 minutes 40 seconds. K. K. Somayya (Coorg) won the silver medal for second place and it will be interesting to see whether any of the younger students can stop him from winning next year. V.B. Koppikar (3rd) improved on his own last year's time by the huge margin of 12 minutes 35 seconds. Bagot too cut his time from 57 minutes to 46 minutes 15 seconds. All the first five men home beat C.C. Monnappa's winning time of 50 minutes last year. Times over the 7 mile course in previous years have been as follows;—

1934	45 minutes	27 secs.
1935	44 ,,	25 ,,
1936	48 ,,	42 ,,
1937	50 ,,	nil.

Order.	Name.	Province State or Colony.	Division.	Time. Mins.	secs.
1	A. Olimuthu, (Wins Moopil Nair Cup)	Madras	Senior	44	40
2	K. K. Somayya (Wins Silver Medal)	Coorg,	Junior	45	15
3	V. B. Koppikar	Bombay	Senior	45	55
4	S. H. Bagot	Ceylon,	,,	46	15
5	A. A. Golandaz	Bombay	,,	49	55
6	S. R. Umbarje	,,	,,	50	4
7	N. Nilakantan Nair	Travancore.	Junior	50	15
8	C. Varadarajulu	Madras	Senior	53	4
9	H. I. Shaikh	Bombay	Junior	53	25
10	S. D. Misra	Indore.	Senior	54	15
11	G. N. Mansukhani	Sind.	,,	54	45
12	P. Indersen.	Hyderabad	Senior	54	55
13	I. A. Fernandez	Madras	,,	55	15
14	B. C. Pal	,,	,,		
15	P. Perera	Ceylon	,,		
16	S. Seshagiri Rao Naidu.	Madras	,,		
17	G.M.A. Khuraishy	,,	,,		
18	S. V. Halbhavi	Bombay	Junior		
19	J. P. D'Cunha	,,	,,		
20	P. H. Uttamsingh	Sind	Senior		
	M. Ibrahim Ali	Hyderabad	Junior		
	N. G. Dacha	,,	,,		
23	V. D. Mehendale.	Bombay	,,		
24	N. A. N. Khan	Sind	,,		
25	P. W. Ratnam	Ceylon	,,		
26	S. M. Wagle	Bombay	Senior		
27	L. H. Rodrigues,	,,	,,		
28	Bhagat Singh	Indore	,,		
29	K. Narayanamoorthi	Travancore	,,		
30	Satgur Saran Lal	Orchha	,,		
31	S. H. Korlhalli	Bombay	Junior		
32	K. Andiappan	Madras	Senior		
33	E. Jacob	,,	,,		

VII. Ex-student Mr. C. C. Monnappa, M. R. H:

Old boys of this College will be interested to know that Mr. C. C. Monnappa who was a student of this College during 1935–37 has been selected for the A. I. R. O. last year, and is now undergoing his training as 2nd Lieutenant in 10th Bn. 5th Maharatta Light Infantry, at Belgaum; after this he is to proceed to Delhi to continue his training in different units.

It may be recalled that Mr. Monnappa was a keen sportsman while at the College and won the most coveted champion-ship Richmond Cup and the Marathon Race of 7 miles last year. He had a great liking for the Military career and served in the Mysore state cavalry before he was sent for the Ranger's training.

We most heartily congratulate 2nd Lieut. Monnappa on his selection to A. I. R. O. and wish him a successful career & long life.

VIII. Rao Bahadur, T. V. Venkateswara Ayyar, M. A.

We offer our hearty congratulations also to M. R. Ry., T. V. Venkateswara Ayyar Avl., M. A., Working Plans Officer, on his being honoured with the title of Rao Bahadur, conferred this year. He was the only Madras Forest officer to receive a title this year.

R. O' S and O. R' S.

By, "MAY"

—:o:—

Range Officers do not generally come across that class of criminals who see the electric chair, or the hangman's rope, or the distant voyage to the Andamans, but to deal with the forest offenders whom they do meet, they require a lot of commonsense — a sense which is often quite uncommon! probably fifty per cent of our forest offenders are akin to the hero of *Les Miserables* — fighting hard for their stomachs.

Only those trained for the purpose and technically qualified know anything about law courts. To a lay man the court appears a "Tower of Babel". Even qualified people are often troubled by those quibblers and sellers of law. I remember a pun about them; "What does a lawyer do when he dies?" "He lies still!" What can a Forest Ranger do against these pillars of law who do their work even in the other world! The justice that is meted in courts is based on evidence, and so a truth without proper evidence has no chance of establishment in law-courts.

Coming to our offence reports, it is the Forest Guard who is supposed to guard the forest and is generally an illiterate, or semi-literate man who puts up a case. The watcher, his assistant in duty, should be by his side, or else no case. Apart from this the court may want an impartial witness. Who can produce a disinterested witness in a case which is to be detected within a reserved forest, where an outsider is chargeable for trespass? And rules are such that if a fellow goes with the forest produce just outside the boundary line the subordinate will have to close his eyes and cannot take action! With all this when a true case — all depatmental cases are true! — goes to the court, the magistrates think it a great personal obligation done to us in convicting the accused.

Assuming the Guard to be a literate man and having the watcher by his side, he detects a case. He at once submits a report to the Ranger. The poor Range Officer who is not usually sufficiently well versed with the legal aspect of the case but who is guided by some half-understood departmental rules, submits an O. R. to his superior. His superior who is really not an "advocate" compounds the case. By this time, the F. G. and his assistant forget the case, not altogether, of course, — but both will give contradicting statements — being worried with so many other things. The party refuses to pay the compounding fees and the case goes to the Court.

Now the real drama begins, for really it will be a drama when non-technical people conduct the prosecution with idiots and illiterates for their witnesses, and the climax will be reached when the party contests with a pleader. Himself not qualified, and with his illiterate subordinates, who have forgotten the case long ago, and with faulty offence reports, the poor Ranger will have to go to the Court like a goat to the sacrifice. The hearing date is fixed, and summons served. The R. O. anxiously awaits an urgent order of the D. F. O. to go out of headquarters, or tries to avoid going to Court by taking leave for some pretext or other. He sends his Forester to conduct the prosecution. What more is wanted than the mere sight of a man in our departmental uniform, to make even a magistrate perverse. The case ends in acquital. A satisfactory explanation reaches the head office accusing the subordinates or the magistrate. For, self-protection is the first law in nature.

This in short is a common occurrence in Ranges. It therefore seems necessary that ways and means should be devised to equip the concerned forest staff with a sounder knowledge of the legal aspect of the cases. This knowledge, in my humble opinion, cannot be gathered from books alone. I have a suggestion to offer:

In the Madras Forest College, lectures are over by 12 Noon everyday, during headquarters terms, and the students are free until 5 P. M. During this interval, for certain days in every month, the students could be taken (by appointment) to any one of the courts in the city. Let them mentally participate in the prosecutions conducted by the lawyers of the place, and get a good grounding in the legal aspect of the cases.

Due attention is also to be paid to the theoretical side. It is suggested that a course of regular lectures be given to the students by lawyers. Further, a mock court can be organized every week with a lecturer as a trying magistrate and students contesting mock cases, of course, with real zest and fervour. The police depend upon their own special men for conducting

the prosecutions. The present custom of taking their help for our cases should stop as they are neither adepts in our rules nor are they interested in our cases. Thirdly the Forest Ranger's uniform should be modernised and he will then cut a better figure in the law courts.

Let me conclude. Owing to the recent enlightenment of the masses by the various political parties, owing to the rapid onward march of civilization and owing to the improvement of the village communities as a whole, things will not go smoothly as they went in years past.

THE INDIAN CROW.

By, S. R. Umbarje, B. A., *(Senior student, 1936-38. Dn., M.F.C)*

The crow like the human beings, inhabits the major part of the world, and is familiar to every one. It is so common that it speaks for itself. We think we know enough about it. And yet this is not true, for in another sense we never know enough about it. The subject is inexhaustible.

A genus of Passerine birds, and type of a family *Corvidae*, *Corvus* includes Magpies, Jackdaws, etc. The crow family is included in that division of Passeres known as *Acromyodi*, from peculiarities in the vocal organs, and its members share the following characters; the bill is moderately long, strong and thick; bristles at the base cover the nostrils; the wings are of medium size and rounded; the tail is not prominent; the feet are strong. The genus is distributed in most parts of the world except south America and New Zealand. It consists essentially of tree birds, which generally build their nests on trees. In diet they are predominantly vegetarian.

Corvus splendens. The Indian House Crow, or the grey-necked crow is like a jackdaw in marking and appearance—glossy black, except for nape, neck, upper back and breast, which

are ashy brown. The hue of this ashy brown varies considerably with the locality, being lightest in the Punjab. The nesting season is from May to July, or even later. It was once aptly named *Corvus impudicus*, and one could wish that name had remained.

"Like the 'Mahar' outside an Indian Village, whose perquisite is the hides of all the cattle that die in the village, the crow lives outside the bungalow and claims the refuse of all food eaten within it. But if you do not provide a reasonable amount of refuse, the crows will come inside and help themselves, for there is no right to which the crows cling more tenaciously than the right to be fed by the man whose compound they clean."

— *E H A.*

The common crow frequents the towns, feeding on offal, and boldly enters rooms through open windows, to snatch some morsel from the dinner-table. This fact is well known to the Forest College students as there are many crows to be seen in the College Estate. Come at any time to the students' quarters and you will see crows sitting either on the roofs of kitchens or on nearby trees. Especially at about 1 O'clock in the afternoon when the students have just finished their meals, they will quietly come and wait for an opportunity. Though you are sitting in front of your room, they will first come and enter the dining hall quietly and make much of whatever has been left by the servants. You get up to drive them, they will not go, but simply squat and pretend to move. You get irritated and throw stones at them. They make much noise and in a minute you find many other crows pouring in. They will hold a conference on a nearby tree and like some Municipal Councillors discuss the question in a loud tone without coming to any conclusion. Your peace of mind is lost and you again drive them. They will make a terrible hubub as if to tell you that you are the cause of all this and that you are encroaching upon their legitimate liberty and you are invading their own territory. They themselves are clean but they have no idea of cleanliness. They take pleasure in spoiling your newly washed

clothes and table cloths that have been hung for drying outside. During our Camp at Ayyalur we were frequently visited by crows. Every day early in the morning they would make a hell of a noise like the newspaper boys in the towns, who disturb your sleep. Two crows used to wait upon me everyday in the afternoon for meals. Throw a piece of bread in the air and they will catch it in their mouth in the air, very quick indeed. Poor fellows, I don't know what they got when we were absent on a full day's excursion.

The crow has no sense of decency and I think he has never been a chivalrous fellow. He pesters a man or a woman, a boy or a girl a child or an old man all alike. Once in my house, when I was a boy, the women folk in my family were preparing "papadams" and my old grandmother was left in charge on the terrace where they were exposed for drying. The crows in a few minutes gathered on a nearby tree and having come to know that the person in charge was helpless, they began to pester her. My grandmother tried her best to drive them away, but in vain. Naturally she called me as I was the only boy present in the house, having taken a "French leave" from the school. Of course I was able to manage them, but only after a long time. It is a common sight in Indian villages to see crows on the roadside, where a traveller sits in a cool place to finish his mid-day meal. Mr. *Eha* writes about the black crow, "it often haunts our back premises in company with the others and snatches a share of anything that may be going, it is still a wild bird, and you will often find it at home in the jungles. It is very abundant on shady country, roads, feeding on the fruit of the Banyan tree or the Peepal, and when the traveller sits down in a cool place and lights a fire to cook his mid-day meal, the black Crows see the smoke from afar and come to wait upon him."

The Hindus are very superstitious about the crow. If a man sees a crow sitting on the roof of his house — making a noise in the morning, he believes that his house will be invaded

by unknown guests. I wish this proves true as I could either leave the place before the guests arrive or make arrangements for them. If a man going on an important business or errand, sees a crow flying across his path to his left, he knows it for certain that it is a bad omen. Many a battle has been lost because of this superstition. I know, once my uncle was to go to Bombay in connection with a case in the High Court. To his ill luck he found a crow on the road and at once he came back home instead of going to the station. It goes without saying that he lost the case. Who knows, if he had gone to Bombay, he might have won it.

Another interesting superstition about the crow is that if any one sees two crows mating, he is sure to die. To avoid this fate he arranges to spread the news that he is dead; his near relatives then come to his house for condolence and partake of a sumptuous dinner! It is believed that by this farce the person escapes death.

Such is the Indian Crow that Mark Twain had immortalised in his essay "The Indian Crow". Everyone admires and at the same time hates the Crow; admires it because of its daring and hates it because of its cruelty. No one can forgive the constant and ruthless massacre of innocents that goes on where Crows are allowed to have their own way. They watch every little bird that flutters out on its untried wings, catch it under one foot and pick it to pieces, absolutely callous to the shrieks of the parents as they flutter round, distracted but helpless.

An artificial key for the identification of the commoner trees, shrubs and woody climbers around Aiyalur (Madura District).

By, Rao Sahib V. N. Seshagiri Rao, B. A., M. F. S., *and G. Viswanatham*, B. A.

—:o:—

While the more detailed floras of the Madras Presidency are wider in their application, more exhaustive and technical in character, and are based on the minute structure of the flower and fruits of the species, the following key is of local application to the forests adjoining Aiyalur, is based on the external or "forest" characters, and is intended for the ready recognition of the species by the average forester. Aiyalur is a forest camp visited by the students of the Madras Forest College annually. A brief description of the locality, and the floristic composition of the forest would be of help for a proper appreciation of the key.

Aiyalur is the head quarters of a range of that name and lies in the Madura Forest Division. The forests are situated on more less flat or slightly undulating ground, and the soil is shallow and dry. In places it is alkaline and sandy. The South-west monsoon is not felt while the bulk of the precipitation is received during the North-east. The average annual rainfall is in the neighbourhood of 20 inches. The mean annual temperature is about 80°

The forests are characteristic of the dry deciduous type consisting mostly of open scrub of dwarfed specimens of Acacias of which *Acacia planifrons* is predominent. Other common species composing the tree crop are *Zizyphus*, *Carissa*, *Randia*, *Dodonaea*, *Cassia*, *Dichrostachys*, etc. Dry evergreen species of small size, such as, *Memecylon edule*, *Mimusops hexandra*, *Maba buxifolia*, occur in moist situations. *Euphorbias* and other xerophytes are common. The ground flora consists mostly of grass and a few shrubs.

Abbreviations used:—

Ls.	:	Leaves (blade)	Nd.	:	Nerved.
Stip.	:	Stipulate.	Ns.	:	Nerves.
Stips.	:	Stipules.	Sec. ns.	:	Secondary nerves.
In.	:	Inch or inches.	Infl.	:	Inflorescence.
Simp	:	Simple.	Fls.	:	Flowers.

Comp. : Compound Fr. : **Fruit.**
Alt : Alternate Diam. : **Diameter.**
Opp. : Opposite.

Scheme of the Key:

A. TREES.

Ls. Simple. (49)
Alternate. (32)
Juice milky. (7)
Stipulate (6)
Fr. a fig. (5)
Petiole short, stout, not jointed to blade; apices of ls. not caudate acuminate: (3)
Receptacles sessile, usally in axillary pairs. Ls. 3–7 nerved ... 1. *Ficus bengalensis.*
Receptacles stalked, on leafless branches, clustered;
Ls. 3– nerved ... ... 2. *Ficus glomerata.*
Petiole long, slender, jointed to blade:
Receptacles sessile, in pairs;
Apices of ls. caudate acuminate;
Tip half as long as blade, 5–7 nerved;
Petiole terete. Receptacle dark-purple when ripe ... 3. *Ficus religiosa.*
Apices of ls. not caudate – acuminate:
Blade 3 – ribbed, Figs white, flushed with red ... 4. *Ficus infectoria.*
Fr. long, cylindrical, tubercled.
Ls. in young plants often lobed. Adult ls. oblong to obovate dark-green & glossy above; lateral nerves 7-8 pairs ... 5. *Artocarpus integrifolia.*
Exstipulate:
Ls. coriaceous, with many fine parallel nerves with intra – maginal vein. Fruit a berry ... ... 6. *Mimusops hexandra.*

Stipulate. (6)
Exstipulate.
Juice not milky.
Stipulate (22)
Penninerved. (11)
Palmi, – or basal nerved. (22)
Armed.
Unarmed.
Exstipulate.
Penninerved. (28)
Armed.
Unarmed.
Opposite or Sub-opposite. (42)
Stipulate. (40)
Exstipulate.
Opposite:
Basinerved.
Penninerved.
Ls. compound.
Alternate. (75)
Bifoliate. (51)
Trifoliate. (56)
Pinnate. (73)
Pari-pinnate. (63)
Imparipinnate. (73)
Palmate.
Opposite:
3 – foliate.
5 – 7 foliate.
Bipinnate. (87)
Armed.
Unarmed.
Bi – or tri-pinnate.

B. SHRUBS.

*Key for shrubs will appear in the next issue of the magazine.

*Such a number in brackets refers to the number of the tree beginning with the opposite characteristics.

JUICE NOT MILKY:
STIPULATE: (22)
PENNINERVED: (11)
Ls. DISTICHOUS:
Fruit samara :
Branchlets drooping. Ls. asymmetrical, giving a pungent smell when crushed ... ... 7. *Holoptelia integrifolia.*

Fruit a capsule;
Seeds arillate. Ls. pellucid punctate; old ls. blotched with red; all parts bitter ... ... 8. *Casearia tomentosa.*

Seeds not arillate. Ls. not gland-dotted, small, orbicular – obovate ... ... 9. *Cleistanthus collinus.*

Fr. a red edible drupe:
Seeds arillate, grooved. Ls. asymmetrical very coriaceous, margin repand – toothed ... ... 10. *Hemicyclia sepiaria.*

PALMI-, OR BASAL-NERVED: (22)
ARMED:
Ls. densely tomentose beneath. Fr. yellow or red when ripe, edible, Bark dark, rough. ... ... 11. *Zizyphus jujuba.*
Ls. pubescent or hairy beneath. Fr. woody, greenish white, not edible. Bark grey, with ablong scales ... ... 12. *Zizyphus xylopyra.*

UNARMED:
Bark mucilaginous, fibre tenacious, hairs stellate: (19)
Ls. entire,
Ls. cordate, branchlets with peltate scales. ... ... 13. *Thespesia populnea.*

Ls. lobed.
Fr. a follicle, young shoot velvety red ... ... 14. *Sterculia urens.*
Fr. a copsule, seeds winged. Ls. asymmetrical, distichous, silvery white beneath ... ... 15. *Pterospermum suberifolium.*

Ls. serrate or crenate, asymmetrical, gonophore present;
Fr. a drupe:
Fr. 4–lobed:
Ls. oblong lanceolate, 3–nerved. Flowers white ... 16. *Grewia disperma.*
Fr. 2–lobed:
Ls. ovate. very oblique, cordate at base; petiole over ½ in. stipules falcate ... ... 17. *Grewia tiliaefolia.*

Ls. ovate – oblong often subequal, persistently hoary tomentose beneath. Petiole 0.3 in. ... ... 18. *Grewia rotundifolia.*

Bark not mucilaginous, hairs not stellate.
Ls. distichous, base oblique; glabrous and shining above:
Basal nerves extending near to the tip: young ls. red. Petiole 0.2 to 0.4 in long ... ... 19. *Celtis cinnamomea.*

Basal nerves reaching only half of blade.
Ls. rough above, softly white – tomentose beneath.
Young ls. not red. Petiole less than ¼ in ... 20. *Trema orientalis.*
Basal nerves reaching apex of blade; young ls. not red.
Petiole ¼ in. Fr. yellow ... ... 21. *Zizyphus trinervia.*

EXSTIPULATE:
PENNINERVED. (28)
ARMED.
Ls. pellucid punctate, unifoliate. Fr. a globose berry ... 22. *Atalantia monophylla.*

Ls. not pellucid punctate, Calyx acrescent. Bark reddish and pale. Fr. with a conical tip ... ... 23. *Diospyros montana.*

UNARMED:
Ls. more than 3 in. long:
Juice acrid, blackish:
Ls. elliptic oblong. Fr. a drupe ... ... 24. *Mangifera indica*
Ls. obovate. Fr. a drupe seated on a fleshy pear – shaped hypocarp ... ... 25. *Semecarpus anacardium.*

Ls. under 3 inches.
Juice yellow turning to black ... ... 26. *Ehretia ovalifolia.*

Juice watery, (not coloured), twigs strigose.
Ls. when crushed giving a pungent smell. Fr. a ring of carpels on a woody stalk ... ... 27. *Miliusa eriocarpa*

PALMINERVED:
ARMED:
Thorns bearing ls. Ls. narrowly oblong, lanceolate, entire, pubescent, pellucid – punctate. Fr. a succulent drupe crowned by calyx and ribbed when dried ... ... 28. *Alangium salvifolium.*

UNARMED:
Fr. winged.
Petiole over 2 in. juvenile ls. deeply lobed, principal nerves 3, of which lateral nerves are forked. Bark silvery grey. Leaf-scars prominent. Ls. clustered towards ends of branches ... ... 29. *Gyrocarpus americanus.*

Fr. not winged:
Ls. small, (upto 2 in.), grey tomentose when young; margins of fruiting calyx recurved ... ... 30. *Cordia domestica.*

Ls. large (upto 8 in) upper surface with white cystoliths, lower fulvous - tomentose; margin of fruiting calyx strongly recurved ... ... 31. *Cordia evolutior.*

OPP., OR SUB-OPP:— (42)
STIPULATE: (40)
STIPS. INTRA–, OR INTER–PETIOLAR: (39)
STIPS, INTRA–PETIOLAR:
ARMED:
Spines in pairs, often leaf-oearing ... ... 32. *Gardenia turgida.*

UNARMED:
Leaf-buds encased in transparent bright-yellow gum – resin ... 33. *Gardenia gummifera*

STIPS. INTERPETIOLAR: (39)
Fr. a succulent syncarpium formed by the confluent calyces ... 34. *Morinda tinctoria*
Fr. a head of minute capsules each separating into 2 cocci. Seeds very small, & winged:—
Ls. orbicular-cordate, pubescent below, (4–10 in.) veins not prominent. ... ... 35. *Adina cordifolia.*
Ls. obovate, (2–7 in.) veins prominent. ... ... 36. *Mitragyna parvifolia.*

Fr. a drupe.
Ls. bifarious, dark-green, ovate, upper side very shining sec. ns. 3–5 ... ... 37. *Plectronia didyma.*

Ls. not bifarious, oblong with a cordate base, sec. ns. 12–14 ... 38. *Ixora parviflora.*

STIPS. NOT INTRA –, OR INTER–PETIOLAR:
Stips. minute, connected by a line. Branches drooping. Ls. coriaceous, glaucous, nerves obscure. Fr. a red berry on a persistent calyx; tasting mustard (as also the ls). ... 39. *Salvadora persica*

EXSTIP:
SUB–OPP:
Fr. obscurely 5-angled, petiole 1½ to 3 in. Ls. clustered at ends of branches, obovate–elliptic, base acute; pale green ... ... 40. *Terminalia belerica.*

Fr. with 5 equal wings.
Ls. oblong; petiole ¼ to ⅜ in., biglandular at top ... ... 41. *Terminalia arjuna*

OPPOSITE:
BASINERVED: (3 TO 5 NERVED):
Bark thin, smooth, grey; Fr. 1½ to 2 in. diam. orange-red, many-seeded, seeds shining grey-white, coin-like ... ... 42. *Strychnos nux-vomica.*

Bark thick, corky, fissured black. Fr. ¾ in. diam., black, 1–2 seeded ... 43. *Strychnos potatorum.*

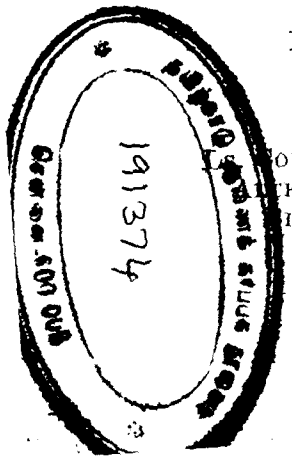
PENNI-NERVED.
Juice milky.
Ls. 3–7 in; Yielding a blue dye, Fr. of 2 distinct linear follicles cohering at tip only ... ... 44. *Wrighia tinctoria.*
Juice watery, copious, sweet; blaze flesh-red. Fr. an ovoid apiculate green drupe. Ls. elliptic, crenate coriaceous, glaucous beneath ... 45. *Elaeodendron glaucum.*

Juice scanty; not milky:
Ls. gland – dotted, with intramarginal nerve ... ... 46. *Sizygium jambolanum.*

Ls. not gland – dotted:
Ls. when crushed give an unpleasant "Premna" smell. Armed ... 47. *Premna serratifolia.*

Unarmed. Ls. 3–7 in. entire, tawny yellow, stellately tomentose ... 48. *Premna tomentosa.*

COMPOUND:—
TERNATE: (75)
BIFOLIATE: (51)
Leaflets connate into a 2 – lobed palmately nerved blade.
Fr. a legume ... ... 49. *Bauhinia racemosa*



Leaflets free, pinnately nerved. Fr. a drupe ... ... 50. *Aphania bifoliata.*

BIFOLIATE: (56)
ARMED:

Spinescent, branchlets ending in a spine:
Juice resinous, aromatic:
Leaflets 1–3, usually 1 – foliate, dentate above, obovate.
Inner bark peeling off in papery flakes ... ... 51. *Commiphora mukul.*

Leaflets 3, entire, or broadly crenate, obtuse. Inner bark not peeling off ... ... 52. *Commiphora berryi.*

PRICKLY:

Bark corky, deeply furrowed; prickles straw coloured, leaflets rhomboid ovate, densely tomentose beneath Pod 3–6 in. long ... 53. *Erythrina suberosa.*

UNARMED:

Bark grey, very thin, with horizontal wrinkles, branches with large white lenticels. Ls. clustered at ends of branches. Common petiole 2–4 in. Fr. large, 2–3 in. diam: yellow with white specks. ... ... 54. *Crataeva religiosa.*

Bark smooth, greenish, prickles black, leaflets broadly deltoid acute, glabrous. Pod: 6–12 in. long beaked. ... ... 55. *Erythrina indica.*

PINNATE: (73)
PARIPINNATE: (63)
LEAFLETS 4:
Bark grey, Twigs & inflorescence pubescent; leaf blade 4–8 in. Fr. trigonous, greyish–velvety ... ... 56. *Lepisanthes tetraphylla.*

LEAFLETS USUALLY MORE THAN 4:
Lyrately pinnate:
Fr. a drupe:
Young. ls. deep.red. Fr. not lobed, usually echinate, aril conspicuous, edible. Ls. glabrous ... ... 57. *Schleichera trijuga.*

Young ls. not red. Fr. of 3 drupes, wrinkled when dry Seeds not arillate. Leaflets emarginate, softly pubescent beneath. ... ... 58. *Sapindus emarginatus.*

Not lyrately pinnate:
Fr. a legume.
Fls. yellow, in lax pendulous racemes, leaflets 2–7 in. long; 4–8 pairs ... ... 59. *Cassia fistula.*

Fls. red, in erect corymbose racemes. Leaflets ¾ to 1½ in. long, 8–20 pairs. ... ... 60. *Cassia marginata.*

Fls. yellow with pink streaks. in. lax racemes. Leaflets ½ to ¾ in. long, 10–15 pairs. Leaflets and fruit pulp acid ... 61. *Tamarindus indica.*

Fr. a capsule (3-valved, with winged seeds.)
Fls. cream, in terminal panicles. Leaflets 1 in. long, 10–20 pairs, gland-dotted, oblique, bark soft, corky ... ... 62. *Chloroxylon swietenia.*

IMPARIPINNATE: (73)
ARMED:
Fr. a large grey woody berry (2-3" diam) Leaflets smelling of aniseed ... 63. *Feronia elephantum.*
Fr. a small black berry. ($\frac{1}{3}$–$\frac{1}{2}$ in diam) Leaflets smelling lime ... 64. *Limonia crenulata.*

UNARMED:
Leaflets entire: (70)
Juice resinous, aromatic:
Leaflets glabrous, terminal leaflets long-petioluled ... 65. *Commiphora caudata.*
Leaflets pubescent, terminal leaflet subsessile ... 66. *Commiphora pubescens*

Juice blood-red, not aromatic:
Ls. stipulate. rachis 7–9 in Leaflets 5–7, each 3–5 in. Fr. a samara ... ... 67. *Pterocarpus marsupium.*

Juice not red.
Ls. ex-stipulate. rachis 12–18 in. Leaflets 7–9, clustered at ends of branchlets. Branchlets stout, leaf scars prominent Fr. a red drupe $\frac{1}{2}$ in long ... ... 68. *Odina wodier.*
Ls. stipulate, Rachis 2" Leaflets 6–7, shining bright green 2–5 in. by 1–2 in. Fr. a woody pod $1\frac{1}{2}$ to 2 in. long ... 69. *Pongamia glabra.*

Leaflets not entire:
Trees with bark & ls. bitter:
Fr. a samara. Ls. very large, 2–3 ft. long, leaflets 8–15 pair, 3–6 in long, densely pubescent. Fls. foetid. Bark grey, smooth; branches decumbent. ... ... 70. *Ailanthus excelsa.*
Fr. a drupe. Ls. 9–10 in. long, leaflets 5–9 pair, 1–3 in. long Fls. honey-scented. Bark dark-brown, rough. ... 71. *Azadirachta indica.*

Trees with resinous juice:
Fr. a drupe. Ls. 12 to 18 in. long. Leaflets 6–10 pair, opp., upto 4 in., crenate, pubescent. Ls. turning red before fall. ... 72. *Garuga pinnata.*

PALMATE:
Trees tall, buttressed, with whorled branches; armed when young, Capsule thick, woody. Leaflets petioluled:
Petiolule about 1inch ... ... 73. *Bombax malabaricum.*
Petiolule under 0.3 inch ... ... 74. *Bombax insigne.*

OPPOSITE:
Trifoliate, petiole winged. Fr. a drupe. Seeds not winged. Leaflets sessile... 75. *Vitex altissima.*
5–7 foliate, petiole not winged. Fr. a capsule. Seeds winged. Leaflets stalked:
Calyx spathaceous. Capsule linear, compressed arcuate, speckled.
Leaflets acute, (not caudate) ... ... 76. *Dolichandrone atrovirens.*

Calyx not spathaceous. Capsule 4-angled, spirally twisted. Leaflets caudate. ... ... 77. *Stereospermum tetragonum.*

BIPINNATE; (87)
ARMED: (84)
Pinnae 2:
Each pinna with only 2 leaflets, Leaflets 2 in. Seeds arillate ... 78. *Pithecolobium dulce.*

Pinnae more than 2:
Spines leaf-bearing.
Pinnae 9–10 pair. Leaflets 12–15 pair. Fls. in dense clylindrical spikes, upper fls. yellow; lower pink. Pod flat twisted, brown, 2–3 in. ... ... 79. *Dichrostachys cinerea.*

Spines not leaf-bearing:
Crown flat-topped:
Pinnae 3–4 pair. Leaflets 5–10 pair. Pod 2–3 in long, cylindric... 80. *Acacia planifrons*
Crown not flat-topped:
Spines curved:
Pinnae 4–6 pair. Leaflets 15–30 pair. Pod 3–7 in. flat, brown. ... ... 81. *Acacia ferruginea.*

Spines straight:
Spines upto 2 in. Pinnae 3–6 pair. Leaflets 10–20 pair. Pod moniliform, grey-downy. Fls. in heads. Bark dark. ... 82. *Acacia arabica.*

Spines upto 1 in. Pinnae 5–10 pair. Leaflets 15–25 pair. Pod linear, strap shaped, 4-6 in. densely velvety hairy. Fls. in spikes. Bark grey ... ... 83. *Acacia leucophloea.*

40

UNARMED:

Midrib central:

Pinnae 6–15 pair. Leaflets 15–24 pair, each ¼ in. by ⅛ in. Pod 5–8 in. by ¾–1 in., very thin. ... ... 84. *Albizzia amara.*

Midrib parallel to, & near upper edge:

Pinnae 2–4 pair. Leaflets 5–9 pair, each 1–1¾ in. by ½–¾ in. Pod 6–12 in., straw-coloured ... ... 85. *Albizzia lebbek.*

Pinnae 3–8 pair. Leaflets 10–25 pair each ¾ to 1¼ in. by ¼–⅓ in.

Pod 5–9 in. by about 1 in: reddish brown with darker markings over seeds. ... ... 86. *Albizza odoratissima.*

2–3 PINNATE:

Fruit a drupe. Leaflets: serrate, 5–11. Bark smooth, dark-brown ... 87. *Melia dubia.*
Fruit a 3–angled capsule. (1–1½ ft. long). Leaflets: entire, 8–12.

Bark corky, pale. ... ... 88. *Moringa concanensis.*

41

	Botanical Name.	Trade or English Name.	Tamil Name.
1.	Acacia arabica.	Babul.	Karuvelam.
2.	,, ferruginea.		Parambai.
3.	,, leucophloea.		Vel velan.
4.	,, planifrons.	Umbrella Thorn.	Sitai.
5.	Adina cordifolia.		Manjakadambai.
6.	Ailanthus excelsa.	Tree of Heaven	Peemaram.
7.	Alangium salvifolium.		Alingi.
8.	Albizzia amara.		Usil.
9.	,, lebbek.	The Siris.	Vagai.
10.	,, odoratissima.	Black Siris.	Selai Vagai.
11.	Aphania bifoliata.		
12.	Artocarpus integrifolia.	Jack.	Pila.
13.	Atalantia monophylla.		Kurunthu.
14.	Azadirachta indica.	Neem.	Vembu.
15.	Bauhinia racemosa.		Athi.
16.	Bombax insigne.		
17.	,, malabaricum.	Red Silk Cotton Tree.	Olugu.
18.	Casearia tomentosa.		Chilaka–Duddi (Tel)
19.	Cassia fistula.	Indian Laburnum.	Konnai.
20.	,, marginata.		Sennkonnai.
21.	Celtis cinnamomea.		
22.	Chloroxylon swietenia.	Satin Wood.	Porasu.
23.	Cleistanthus collinus.		Odugai.
24.	Commiphora berryi.		Mullu Kiluvai
25.	,, caudata		Pachakiluvai.
26.	,, mukul.		
27.	,, pubescens.		Malaikiluvai
28.	Cordia domestica.		Narvili.
29.	,, ovolutior.		
30.	Crataeva religiosa.		Mavalingam.
31.	Dichrostachys cinerea.		Vedathalai.
32.	Diospyros montana.		Karinthovarai.

33.	Dolichandrone atrovirens.		Poompbadiri.
34.	Ehretia ovalifolia.		
35.	Elaeodendron glaucum.		Karukkuvachi.
36.	Erythrina indica.	Indian coral tree.	Kalyana Murukkan.
37.	,, suberosa.		Mul Murukkan.
38.	Feronia elephantum.	Wood–apple.	Vilam.
39.	Ficus bengalensis.	Banyan	Alai.
40.	,, glomerata.		Atti.
41.	,, infectoria.		Juvvi.
42.	,, religiosa.	Peepul Tree.	Arasu.
43.	Gardenia gummifera.		Kambili Pisin.
44.	,, turgida.		Malankarai.
45.	Garuga pinnata.		Pazhanimaram.
46.	Grewia disperma.		
47.	,, rotundifolia.		Uduppai.
48.	,, tiliaefolia.		Thadasal.
49.	Gyrocarpus americanus.		Tanaku.
50.	Hemicyclia sepiaria		Virai.
51.	Holoptelia integrifolia.		Tapachi, Awie.
52.	Ixora parviflora.		Korra.
53.	Lepisanthes tetraphylla.		Kukamutti.
54.	Limonia crenulata.		
55.	Mangifera indica		Ma – Maram.
56.	Melia dubia.		Mala Vembu
57.	Miliusa eriocarpa		
58.	Mimusops hexandra.		Kanupala Karupala.
59.	Mitragyna parvifolia.		Nir – Kadambai.
60.	Morinda tinctoria.		Nuna.
61.	Moringa concanensis		
62.	Odina wodier.		Odiamaram.
63.	Pithecolobium dulce.	Manilla Tamarind.	Kodukkappuli.
64.	Plectronia didyma.		Sulundu.
65.	Pongamia glabra.		Pungam.
66.	Premna serratifolia		Minnai.
67.	,, tomentosa		Kolukatta Teku.

68.	Pterocarpus marsupium.		Vengai.
69.	Pterospermum suberifolium		Sempulagu.
70.	Salvadora persica	Tooth Brush Tree.	
71.	Sapindus emarginatus.		Naikottan.
72.	Schleichera trijuga	Lac tree.	Pulichi.
73.	Semecarpus anacardium.	Marking nut.	Shenkotta.
74.	Sterculia urens.		Shentanakku.
75.	Stereospermum tetragonum.		Poopadri.
76.	Strychnos nux-vomica.	(Nux – vomica)	Kanjeerai.
77.	,, potatorum	(Clearing nut)	Tettan.
78.	Sizygium jambolanum.	(Black – plum)	Navai.
79.	Tamarindus indica.	Tamarind.	Puli.
80.	Terminalia arjuna		Kula – Maruthu
81.	,, bellerica.	Beleric Myrabolan.	Thani.
82.	Thespesia populnea	Portia tree.	Puvarasu.
83.	Trema orientalis	Charcoal tree	Omai.
84.	Vitex altissima		Mayilei
85.	Wrightia tinctoria.		Palai, Veppalai.
86.	Zizyphus jujuba.		Elandai.
87.	,, trinervia.		Karukuva.
88.	,, xylopyrus.		Mulkottan.

Rab Regeneration in the Nallamalais of Kurnool West Division.

——:o:——

By, D.V. Nagaratnam, M.R.H., Range Officer, Balapalle, S. Cuddapah.

———

The writer of this note held charge of Bairlooty range, West Kurnool, from April 1933 to December 1936, and carried out rab regeneration in the felled coupes for four consecutive years.

The main theme of silviculture being that every tree that is removed should be replaced naturally or artificially, now-a-days working plans prescribe the rab method for almost all deciduous forests where felling is going on, whether it is clear felling of a coupe or coppice with standards or is a gap felling as in selection fellings.

In Kurnool west, the growing stock in the forests of the Nallamalais is abnormal because the high sea of grass impedes the growth of natural regeneration, fires are common and cause heavy damage to the stand and to the natural regeneration on the ground.

The present working plan has been in force from 1929–30, and the first coupes were felled in that year. The felled coupe of the year is regenerated in the succeeding year by the "Rab" method. This is prescribed for the pole (Coppice with standards) and the fuel (clear felling) working circles, the rotations being forty and thirty years respectively, and also for working circles where selection fellings are carried out for spokes and felloes and for *yepi* (Hardwickia binata) posts extraction. *This note is confined to the "rab" work in the pole and fuel workin Circles.*

The stand in both circles consists of common deciduous trees, the former generally lie in the main reserve and the latter in the extensions of the terai forests. Natural regeneration is fair but the seedlings fail to progress, either through being smothered or burnt away annually in the high sea of grass so characteristic of the Nallamalais. Physical features and soil conditions in these two working circles vary from flat plain ground to rocky hill slopes and from rich loamy soil to beds of boulders. There is an admixture of bamboo and the quantity varies with each locality; where streams run bamboo is plentiful.

Availability of brush-wood and its use in the "rab" work: The first attempt at "rab" work in this division was in the year 1928–29. It is of paramount importance for "Rab" work that there should be felling refuse available in the coupe, and in West Kurnool this is not wanting. The coupe contractors remove no brushwood and there is no demand for soft woods such as *Cochlospermum gossypium*, *Girotia rottleriformis*, *Gyrocarpus jacquinii*, *Dalbergia paniculata*, *Boswellia serrata*, etc. and these form about ten per cent of the crop. There is no demand for brushwood even in fuel coupes.

From the year 1929–30, for "Rab" regeneration work in the three pole coupes of Bairlooty range (Nagalooty, Bairlooty and Pasurulla felling series), the Working plan prescribes that the debris be heaped *in lines*, and these were formed either continuous or in broken lines according as the brushwood was plentiful or not.

The formation of brushwood lines was not perfect in the beginning. This was partly due to apathy on the part of the contractors and to their dislike to do the work in a systematic manner which cost them more and partly because the Beat subordinates did not understand the technique and did not insist on proper work. There has been improvement each year as contractors and the subordinates gained experience.

In 1933, the formation of the brushwood in lines was standardized for all the felling series and the contract agreement specified the width to which the slash is to be piled as 10 feet and the height as 4 feet, the length depending upon how much brushwood there was available. This width was found later to be inadequate for tending the young seedling crop and so in 1934 (*et seq.*), the width to which the slash is to be piled was increased to 20′, the height remaining at 4′ and the lines being either broken or continuous. The height of 4′ is to be after the brushwood is well beaten down and compressed on the lines. We call these lines in which the slash is dumped ***Rab strips.***

The distance between the rab strips varies with the amount of the slash in the felled coupe. In localities were there will be plenty of slash, the lines are formed from one boundary of the coupe to the other, generally parallel to the strip lines or (rarely) along the contours of the steep hill slopes. The boles of rejected trees are billeted and are thrown on the edges of the Rab strips and any straight rejected bole is laid along the strips with the double object of preventing it from acting as a fuse in late fires and also to cause an overburn on the edges and keep away grass. In fuel coupes the slash is put in patches or in broken lines. The dimensions of the patches were originally fixed in the agreement as 10′ × 10′ (4′ high) but as experience was gained the dimensions were increased to 20′ × 20′ and the height was reduced to 3′. In dumping the slash the blank areas are previously marked and the contractor is made to pile the debris in heaps of stipulated dimensions in the blank areas. The work of forming the brushwood lines is done free by the contractor. The expenditure involved in this operation varies with each coupe. No reliance can be placed on the figures given by the contractors for the costs of this item. The work is however done by the Chenchus on contract and hence it can be safely put that the cost of piling slash either in lines or in patches is from Rs. 16/- to Rs. 30/- per acre of *actual Rab area*, and the department does not spend anything

on this item of work. It is obvious that where there is a large admixture of bamboo and the growth is thorny the operation costs more than in a place where the stand consists of trees with straight boles.

In the Nallamalais or West Kurnool, it is obligatory on the part of the contractor to employ the Chenchus of the nearest gudem to work the coupe, and permission to employ non-Chenchu labour is given only when all the available Chenchu labour is fully employed. This factor also influences the cost of slash heaping; Chenchu labour is more costly than non-Chenchu labour in the latter part of the day. The Chenchu cannot do a full day's work.

The formation of slash lines is done simultaneously as the fellings progress and the contractor must finish the first strip satisfactorily before he gets permission to work the second strip. The lines are formed by the end of December and when the contractor leaves the coupe at the end of the lease period in March of the next year, he has to put all slash and any rejected produce into the lines and leave the coupe clean and ready for regeneration operations. The expenditure for Rs. 16/- to 30/- for dumping the slash per acre of Rab on the part of the contractor may seem high but this is only for the actual rab area which varies from three acres to ten acres of a coupe of an average total area of fifty acres. It is obvious that for a coupe where there is very much brushwood and consequent large Rab area the rate paid is far less than for the coupe which gave a smaller Rab area and this particularly applies to coupes where there is bamboo growth. The debris in compressed lines dries up till the end of April.

Burning debris and soil-preparation: The working plan prescribes that the bulk of the brushwood should be reduced in the early burning of the coupe in December and January and the burning and sowing of seeds should be compled by the end of Aprhl. This was adhered to in the beginning. While early

burning the felled coupe, a certain amount of light branchwood that formed the lines was reduced to ashes. No doubt the bulk was reduced but no attempt at saving that valuable nutrient material, the ash, was possible and it was mostly lost either in winds or by wash in early rains. The unburnt branchwood and logs of wood remaining in Rab strips were reformed by adding any other slash remaining in between the Rab strips and the strips were burnt by the subordinates by the middle of April, and all unburnt wood was reduced to ashes. The resulting ash was mixed up with the soil by a rake. The depth to which the soil was wounded varied according to the nature of the soil. On hard ground it was merely superficial and on flat alluvial or loamy soil the depth varied from two to three inches. The soil is generally hard in April as early showers are uncommon on the western slopes of the Nallamalais.

From 1933, the act of reducing the bulk of the debris by early burning was found inadvisable as too much ash was lost thereby. Also the month of April for burning the slash was found unsuitable as the soil preparation could not be properly done for want of any moisture in the soil. As the first showers here are in the middle of May, burning of brushwood strips is undertaken in the last week of April and is done by the subordinates in charge of the coupe. They have to bestow some attention so that an overburn is not caused. Logs left by the contractor unbilleted in the middle of the strip continue to burn for a long time and deteriorate the soil; hence when the whole bulk of the debris excluding the big logs is reduced to ashes the unburnt logs are pushed on to all edges and allowed to smoulder there. The object of this has already been explained, i. e., edges of the rab strips are so sterilized as not to allow even the growth of grass, not to speak of other weeds.

Different methods of soil preparation:

After the burning of slash is completed and as soon as the strip is cooled which will be in two or three days, the preparation of the soil in the strip to receive the seed is started. Various methods were tried:—

(1) Ploughing the entire rab strip with a plough (an iron Nageli) (2) Ploughing the rab strip with a plough in furrows at regular espacement (the espacement tried in 1934 is 1½′ and from 1935 onwards it is 2′). (3) Using the time honoured 'Gorru' or the rake. (4) Pickaxing the strip at the regular espacement of 1½′ and 2′.

Differences in cost are not much; item 1 costs the most Rs. 4–8–0 per acre, item 4 the least Rs. 3–8–0. The average is Rs. 4/- per acre of *actual Rab area*. The advantages and disadvantages of the methods were studied. The application depended upon local factors; ploughing the entire rab strip was practicable in plain country and pickaxing was necessarily to be adopted among boulders and on hill slopes. The depth of soil working was not less than 4 to 6 inches in recent years and every effort is made to secure this depth.

The mixing of the ash and the preparation of the strip to receive the seed is systematically carried out by one or other of the above methods taking advantage of a shower to moisten the soil and facilitate the soil working. At any rate this operation is not delayed beyond the middle of May.

Choice of Species.

In West Kurnool, there is a perpetual demand for timber of *Pterocarpus marsupium* and *Chloroxylon swietenia* for cart wheels and frames and for wheel boxes. There is demand for building materials of Teak, *Terminalia tomentosa*, *Hardwickia binata*, *Anogeissus latifolia*; timber of other species has not much value locally.

The working plan precribes the introduction only of timber species in the rab work in the pole coupes the same as those that are retained as standards viz:

(1) *Teak.* (2) *Pterocarpus marsupium.* (3) *Terminalia tomentosa.* (4) *Chloroxylon swietenia.* (5) *Dalbergia latifolia* (5) *Hardwickia binata.*

Upto 1933, *A. lebbek*, Nim, and *Anogeissus latifolia*, were also sowed. Later on only Nos. 1 to 4 were used. In fuel coupes many other species are sowed in Rab work, such as *H. binata*, *A. lebbek* and *A. odoratissima*, Nim, *A. latifolia* and *Cassia siamea*. Rafters of *Cleistanthus collinus* have a special value and attempts to collect seeds for 1936 sowings were made, but the seed year was very poor for this species and hence it could not be introduced.

Collection of seeds:

The required quantity of seed is calculated in advance. The particular seed in each strip is decided upon according to the physical features and nature of the soil in the rab strip; Teak for well drained soil, *T. tomentosa* for low lying tracts, other species not very exacting are given strips at convenience. The seed is collected by the subordinates free of cost. The collection is made from mature trees which are either previously marked out as 'mother tree' or specially selected in the forest. The seed collection is commenced in January when Teak will be available and the collection will be continued up to May for *C. swietenia*, and even upto June for neem seed. When there is a failure of a particular selected species, the seeds are obtained from other divisions. Teak seed is usually got from Coimbatore and Mudumalai, and the exotic *Cassia siamea* from Chittoor.

Sowing of seeds:

Prior to 1933 the method of sowing employed was broadcast sowing. Untreated seed was simply scattered in the prepared seed beds of the rab and the seed was covered to its own depth. The subordinates in their anxiety to obtain germination have thrown bags of seeds in the rab strips and the older coupes have now broken lines with seedlings which are growing in thickets. In the year 1930 there was a bumper crop of *P. marsupium* and teak entirely failed. First coupes in the three pole series of Bairlooty Range were regenerated with *P. marsupium* and the germination was plentiful: the growth is so dense that tending is

necessary to free the individuals struggling for existence in the young crop. The average height is now 16′ and the stems are saplings

The next year, 1931, was the year for Teak. There was a good crop of Teak seed and hence Teak was largely used in Coupe II of each felling series. In addition other species such as *A. lebbek* and *A. odoratissima*, Nim, *H. binata* and *A. latifolia* were also sown broadcast. So much success was attained with Teak that interest in the upkeep of all the other species has flagged. There are big patches of Teak throughout the coupes of 1931, the height growth being 18 ft. on the average, and the stems have become saplings. One strip of ten acres of Coupe II of Bairlooty felling series was regenerated purely with teak by a rough method of dibbling the seed and the growth in this area is excellent. The whole area has now the appearance of a Nilambur Teak plantation, quality II, except that the spacing of the trees is not so regular.

In 1932 there was a caterpillar attack, on Teak; rab sown and natural, young and old were completely defoliated throughout the Nallamalais of the division. The leading shoots were eaten away and the result of this was forking of the stems, seen all over the regenerated areas. But for this, our rab sown Teak might have been one of the finest examples of such work.

At this stage the disadvantage of raising pure crops was felt. The defoliator singled out Teak and spared no seedling. Fortunately in all the Teak patches there was profuse natural regeneration of *Adina cordifolia* and *Stephegyne parviflora*. The seeds of these species were disseminated by winds from mother trees which stood near by and deposited upon the prepared seed beds and germinated well, and thus saved the situation by not exposing the soil too much. These rab patches now have a harmonious mixture; Teak answering for the principal species *A. cordifolia* and *S. parviflora* for secondary species.

There was no chance to do much rab work in 1932 as the coupes were not worked in the previous year by the lessees.

In 1933 in two felling series of Bairlooty Range, two coupes, the arrear coupe of 1931–1932 and the coupe of 1932–33 were regenerated. Seed was sown broadcast in rab strips in which the ash was mixed with the soil by the 'Gorru'. A large quantity of seed was used. The following species were put in four coupes.

1. Teak on a limited scale. 2. *Pterocarpus marsupium*, 3. *Terminalia tomentosa*, 4 *Dalbergia latifolia*, and 5. *Cassia siamea* in one or two strips.

In fuel coupes the following species were put.

1. *Hardwickia binata*, 2. *Albizzia lebbek*, 3. *Anogeissus latifolia*, and 4. *Chloroxylon swietenia*.

Dolichandrone crispa had come into prominence in Cuddapah, and a small quantity of this seed was dibbled in six patches in one fuel coupe, and it has grown very well and has put on good height growth. It should be mentioned that in Kurnool this species has been browsed by deer though it was said to be immune. The germination of all species except *A. latifolia* was good; the most successful being *P. marsupium* in pole coupes and *H. binata* in the fuel coupes. *C. siamea* germinated very well, lived for about an year in the fuel coupes and died away at the end of the next hot season; but it is luxuriant and healthy in the pole coupes.

The work so far indicated that rab regeneration of Teak, *P. marsupium*, *T. tomentosa* and *C. swietenia* the principal species of the locality, was possible and efforts were made to systematize the work, and to improve the technique. The following drawbacks were patent in the work of the past three years.

(1) Use of excessive quantites of seed. (2) overcrowding of seedlings. (3) difficulty in carrying out tendings for the backward seedlings. (4) lack of facilities to assess the percentage of germination. (5) lack of control of labour in the operation. Upto 1933, the whole rab work was carried out free of cost by the subordinates. In November 1933 the Conservator of Forests inspected the division. Soon after, Messrs. J. A. Wilson, I.F.S., and S. Ragunatha Rao I. F. S., visited the division from Chittoor and North Cuddapah respectively, and discussed the Rab work with the District Forest Officer, Mr. M. Kesavanunni Nair, I. F. S.

The following improvements were made in the Rab work of 1934.

The soil was worked with a plough or an iron *nageli*, the whole rab strip being ploughed. No islands of hard ground in between the furrows of the *nageli* track were left. Lumps of earth were broken and the soil was well mixed up with the ash and the whole rab strip was levelled. Seeds of different species, Teak, *P. marsupium*, *T. tomentosa*, *A. lebbek*, *C. swietenia*, *A. cordifolia* and *S. parviflora* were sown in lines 1½′ apart and the seeds quite close in the lines, almost touching. Some of the Rab strips were sown purely with untreated Teak, *P. marsupium*, *T. tomentosa*, *A. lebbek* and some of the strips were sown with the above species in alternate lines mixed up in the same strip. The species which by experience was found to germinate well was alternated with the species the germination of which was doubtful; for example the arrangement of lines in one strip was Teak at the edge, next line *A. cordifolia*, next was *P. marsupium*, next was *C. swietenia* and at the outer edge Teak once again. The object of putting Teak at the edges was that it germinates well and puts on height growth quickly and overcomes grass in the second year.

The seed was sown with care; but unfortunately except Teak and a few patches of *A. lebbek* the germination of all other species was very poor. The sowings of 1933 done on the

usual lines gave excellent results and the sowings of 1934 done with much thought and care were very disappointing, Had it not been for the personal supervision of the Range Officer and the forester when the sowings were done there was room for suspicion that the whole work was scamped. During this year the D. F. O. sanctioned some money and so the subordinates felt the responsibility all the more to turn out efficient work.

The cause of failure of *P. marsupium* which germinated very successfully in the previous year could not be easily traced. A feature in the Nallamalais, and I believe it is also general, is that if *P. marsupium* were to give a bumper seed crop this year, the next year the crop is either a failure or a very poor crop. 1933 was a good seed year and 1934 gave a poor crop. The seed was collected in 1934 from the localities of 1933 but it was diminutive in size and the seeds in some localities were shed earlier from the trees than in 1933. This indicated that the quality of seed used in 1934 was not good. Secondly there was no rain for over a fortnight after the seed was put in the ground. This year the depth of soil working was more and the covering of the seed might have been deeper than the optimum. The late rains and the consequent longer stay of the seed in the soil without germinating might have resulted either in the seed being eaten away by white ants or in losing the viability. The net result of 1934 sowings was success with Teak, scanty germination of *P. marsupium*, *A. lebbek* and *T. tomentosa* and total failure of other species sown. This was a shock to the subordinates who worked with enthusiasm.

The rab strips were however not discarded. Tending was done to the survivors. The sanction made for tending operations was not fully expended.

These failed rab strips of 1934 which were kept weeded were planted next year, that is, in July 1935 with stump plants. One year old stumps were not available and hence 2 year stumps of Teak, *P. marsupium* and *T. tomentosa* were prepared from the excess seedlings of 1933 (sowings of May 1933) and were

put both in pure patches and in alternate rows of teak and *P. marsupium* and teak and *T. tomentosa* with an espacement of 3′ × 3′ for mixed crop and 6′ × ′6′ for pure teak. By the end of December 1935 the percentage of success with Teak was 94, *P. marsupium* 62, T. *tomentosa* 28. Maximum height growth of teak is 3½′, average 2½′. The other two species were browsed and no definite data are available for height growth. At the end of one season Teak stumps had put on maximum height of 4 'and average 3′.

The drawbacks in this operation were:

1. The ground was left fallow more or less for one year. 2. The stumps were two years old, could not be pulled with ease, were slightly injured, and were of thickness varying from ¾ to 1½ inches. Yet the results are encouraging and there is a sigh of relief that the coupe of 1934 also contains now an artificially raised crop to improve the growing stock.

The sowing of 1934 in lines indicated that there was (a) decided saving in seeds (b) easier weeding than in the broadcast sowings of the previous years. It was felt that the width of 10′ for rab work was inadequate, for not only the high grass on the edges covers up the rab strips quickly but also the trouble with ground runners was very great and could not be checked with one or two weedings done at intervals of three months. Hence for 1935 sowings the width of the rab strip was increased to 20′ and this condition was embodied in the contractor's coupe agreement and was enforced. Also the espacement of the lines of seeds could be profitabily increased to 2 ft. and the seed at 2″ to 3″ apart in the lines.

1935 sowings were carried out on the above lines. Although the working Plan prescribed the end of April for completing the sowings, soil preparation was put off to the later part of May and sowings were completed by the end of May 1935. There was a shower of rain in the last week of May. One rab strip was exclusively allotted for one species. The species sown are

1) Teak (2) *P. marsupium.* (3) *T. tomentosa.* *A. lebbek* (5) *C. swietenia.* (6) *D. latifolia.* Only untreated seed of these species was used. The debris was put in lines from one end of the coupe to the other but were not dead straight lines and were wavy. All the ground on which ash was deposited was used up for sowing seeds. It is gratifying to note that germination with all species was excellent. The rab strips are full of very healthy seedlings. There is heavy browsing by chital and sambhur of *P. marsupium* and *A. lebbek*, moderate with *D. latifolia*, and *T. tomentosa*. Teak and *C. swietenia* are immune to browsing. It is noteworthy that *C. swietenia* is one that is immune to browsing even in very early stages although the books on silviculture perhaps do not specifically say so. 1935 sowings have produced *C. swietenia* seedlings of average height of 3½ ft. in one season and there are vigorous shoots of 5 ft. to 6 ft. too.

One more improvement made in 1935 sowings is that on the edges of a few rab strips of *P. marsupium*, *C. siamea* was put with the idea of keeping way the grass by its quick growth and spreading foliage and also to act as a fire belt. Only a small quantity of seed was available and this was used on three strips in each of the pole series. Occasional lopping of side branches overhanging the rab seedlings was found necessary. The ideas aimed at have been achieved; the belts of *C. siamea* have kept away grass and have protected the rab seedlings very efficiently in the early burning of the regenerated coupes in 1936.

Thus, 1935 sowings indicated that sowing in lines 2′ apart and with seed close in lines gives good results. The germination of *T. tomentosa* was about 50% all other species being about 80%. There is evident overcrowding of seedlings and though in the earliest stages there might not be much root competition, it leads one to seriously think about the near future of the seedlings in this thick growth.

1936 sowings were completed by the end of May. The prescribed 20 ft. width of rab strip was adopted (estimating for

rab work in Kurnool is done on the *actual* rab area basis), the seed lines being 2 ft. apart. Soil preparation was carried out taking advantage of the pre-monsoon showers to attain the minimum depth of 4 to 6 inches. *D. latifolia* was not used as it will not produce any useful timber within the forty years rotation. *A. lebbek* need not be encouraged in fuel coupes and so this seed was used only when stocks of seed of other useful species were insufficient.

The following four species were sown in 1936 :

1. Teak, 2. *P. marsupium*, 3. *T. tomentosa*, 4. *C. swietenia*. Nos. 1 and 4 germinated excellently; the others were not very successful. As already indicated the alternate bad seed year with these species was feared and the experience of 1934 dawned upon us and we woke up. In July 1936 Teak and *A. lebbek* were put in the strips where germination of the first sowing was scanty with the same espacement of 2′ but in between the original seed lines. Owing to shortage of Teak seed *A. lebbek* had to be used and this species responded to our desire in a week with good germination and filled up the blank spaces. Teak also germinated in about a fortnight being well favoured with rains at intervals of two and three days.

Cassia siamea was put on the edges of all the strips in which *P. marsupium* was sown and it made luxuriant growth. It is a pleasure to see the rab strips of pure healthy teak and *C. swietenia* and also strips of *P. marsupium* and *T. tomentosa* interspersed with Teak and *Albizzia* and *C. siamea* hedges on the edges of *Pterocarpus* strips.

In Bairlooty and Pasurutla Pole felling series the strips in which the germination of *P. marsupium* and *T. tomentosa* was poor were re-stocked in July 1936 with Teak and *P. marsupium* stumps taken from the excess seedlings of 1935 sowing. In Bairlooty series the espacement was 3′ × 3′ where Teak and *P. marsupium* were alternated and 6′ × 6′ for pure teak, and in Pasurutla series only teak stumps were planted at 4′ × 4′ for

quick soil covering. The thickness of Teak stumps varied from that of a man's thumb to one inch. By the end of December 1936 the percentage of success of Teak stumps was 95, & of *P. marsupium* 52. Height growth of Teak was 3 ft. on the average. 1936 rab sowings were very successful. The seedlings are healthy and vigorous evincing the superiority of one year old stumps over two year stumps of bigger than thumb size.

The cost of sowing seeds in lines 2 ft. apart is Rs. 4–4–0 per acre of *actual rab area*. Cost of stump planting is 10 annas per 800 stumps including preparation of the stumps and putting them in crow-bar holes.

Tending :

The working Plan anticipated no weed growth in the first two years on the burnt strips. It prescribed that weeding should however be carried out if there is suppression of seedlings; but the actual state of affairs is far different from this.

On a rab strip burnt with 4′ height of debris, soil worked and regenerated, the obnoxious growth of various weeds, the overrunning of creepers and the influx of grass is amazingly quick soon after the showers in June and July. The young seedlings are smothered if no attempt at weeding is made by the end of July or early in August. Teak is not heavily suppressed on account of its quicker growth and broad leaves but with the rest of the seedlings the suppression is quite apparent. Teak is extremely sensitive in its early stages and unless it is freed quickly the set-back in height growth will be a very prominent feature. Hence it is found that two intensive weedings are quite essential in the year of sowing in August and October in addition to occasional weedings done by the subordinates in their routine visits. The runners and weeds are uprooted. Grass is removed by cutting away to the ground level as it is found to be too expensive to pull it out completely.

To see the result, one strip of *P. marsupium* of 1935 sowings was left unweeded When the Conservator visited the division in December 1935, the state of affairs in the unweeded strip showed the great danger to the young seedlings in not making timely weeding and in December 1936 the unweeded Rab strip had merged with the surrounding crop and the strip was not easily identifiable had it not been for the board indicating its position. The bamboo switches came up luxuriantly in this strip, the overwhelming creepers, weed growth and grass completely covered up the strip and beneath all these there were seedlings of *P. marsupium* slowly dying not having come even to 2" to 3" above ground, whereas seedlings of the same species in the adjacent weeded strip have put on an average height of 2' in spite of a setback in their growth by the browsing of sambhur and chital.

Weedings are essential from the year of sowing for at least three years to establish the seedlings. After that it depends upon the height growth gained by the plants and their condition. It is obvious that they are to be freed from suppression and overhangings and also are to be protected from fire both in the early burning operations and from the ravages of a late fire. Experience has shown that it costs Rs. 5/- to weed an acre of actual Rab area where the germination of the tree species is good for the first weeding and Rs. 4/- per acre for the second weeding. An attempt at soil working around backward seedlings is made at the second weeding but this is in no way done in an ideal manner i. e., not intensively.

Conclusion.

When once the conditions are favourable for the germination of the seed success or otherwise of establishing the crop is purely a personal factor. The enthusiasm and earnestness displayed by the subordinates in charge of the regeneration areas at all stages till the crop is finally established manifest themselves year after year in the results achieved.

The wherewithal to tend the crop is the crux of the problem. There is a limit to the amount of work which can be done in this tending. Anything done over this limit is 'gardening'*. An intelligent subordinate has to make the best use of the allotted amount of money and engage the available staff for supplementing this sanctioned sum and carry on the work efficiently having tight control over labour and judiciously determining the exact amount and nature of work to be turned out at each centre in proper time and in each stage of the crop.

Rab regeneration with valuable species has reached a satisfactory stage in West Kurnool and the principal aim of improving the growing stock by this method is being achieved, at a comparatively low cost.

The technique is being improved year after year under the able guidance of the District forest Officer Mr. M. Kesavanunn Nair I. F. S.

---

*Probably our contributor would write off as 'gardening' the large scale work seen by the College in 1936, and in 1937, in the Ayyalur Range forests of Madura. In the *rabs* and *kumeris* on the dry stony slopes found there, reliance is placed on elaborate soil preparation, with terracing and rough stone bunding as a common feature, and this is coupled with a lot of tending of the young rab-sown seedling crop, eg, soil working, weeding and repeated thinning of congested seedlings. — *Ed.*

EXTRACTS

1. Wondrous Wood.

It would be a Strange world without it:—

BY, R. R.

No doubt many people heard the recent rumours of the timber famine (happily refuted by Mr. W. O. Woodward) with but a passing interest, and quickly forgot them. Few, even in the timber trade, realised that a timber famine would be almost as serious as a stoppage of our food supplies. So largely is our very existence bound up in wood that only the imagination of a Jules Verne could picture the world carrying on without that most adaptable material.

Timber is one of the oldest commodities in the world, and next to stone, is doubtless the earliest material used by man. It certainly is a most wonderful material, for no other substance has been put to so many uses, and none presents such a wide variation of size, colour, texture and price.

Mankind builds with wood; flies in it, rides in it; sails on it; plays with it; clothes with it; and uses it for fuel. It is buried in it, and what a good many do not know, even eats it!

Timber is a natural product, and as with human beings, nature has created all classes and kinds. Wood has been man's "right hand" material ever since the world started, and even to-day it is unsurpassed as a constructional substance. To realise the immense service it has been to mankind, one has only to observe the enormous number of ways in which it is used in everyday life.

As a clothing, wood is mostly used in the form of the chemical-mechanical product called silk; but let us take a day in the life of an ordinary man.

Arising from a bedstead often constructed of wood, resting on a wooden floor, he bathes, uses a nailbrush with a wooden back. Takes his clothes from wooden hangers in a wardrobe made of wood, and removes wooden "trees" from his shoes. Descends a wooden staircase; sits on a chair made of wood, and eats his breakfast from a wooden table. The crockery is

taken from a wooden dresser: his bread is delivered to the house in a vehicle constructed of wood, and is cut on a wooden trenchure. Most likely his porridge is stirred with a wooden spoon; the eggs and bacon are transported in wooden cases, and if his jam is of the cheap variety it will contain wooden pips.

During breakfast he reads the news printed on paper which, of course, is derived from wood. He will then light a wooden pipe with a wooden match, or perhaps (if he is an importer losing money!) a cigar imported in a wooden box. After brushing his hat with a wooden-backed brush, which hangs on a hatstand made of wood, he selects a favourite walking-stick made of some rare wood; walking out, he slams the door, which is also made of wood.

Outside he boards either a bus, tram or railway carriage, all of which are mainly constructed of wood. If it is a railway carriage, he passes over innumerable sleepers of wood, and at his destination his ticket will be taken at a wooden barrier. Upon arrival at his office building he is "lifted" to his own office in a wooden cage, and sees workmen are executing repairs with tools party constructed of wood, and that one is using a wooden rule. Inside the office he sits down to a wooden desk and uses a wooden pencil or a pen with a wooden holder, taken from an inkstand made of wood.

Deciding to leave the office early and take a little recreation, it is not long before he is again in contact with wood. At cricket he plays with a wooden bat and stumps on ground that is fenced with wood. At golf, the handles of his clubs are of wood. His tennis racket is chiefly of wood; wooden posts support the net, and the umpire sits on wooden steps. If he is young and plays football he will find the goal is constructed of wood. If he is old and prefers fishing he will sit in a wooden punt. If he goes motoring he will pass many signposts of wood, and should he pull up at an hotel to ascertain the correct time he will be served on a wooden counter, and he will notice they sell "wines from the wood."

But he may prefer indoor recreation. The billiards table is mainly constructed of wood, also the cues and marking board. Chessmen are usually made of wood, as also are draughts and both are played on a wooden board. Pintables are nearly all wood, and at darts he will throw spiked pieces of wood at a wooden target. Skittles, croquet, bowls and polo are all played with wood in different forms and varieties.

Liking music, he finds the piano, mandoline, violin, guitar, ukelele, and most other sweettoned instruments constructed of wood. Even the gramophone and wireless set are encased in it.

At the theatre in the evening he will gaze on beautiful scenery — of wood and admire the polished wood panelling of the theatre itself as he walks out.

At last, as he climbs the stairs to his bedroom, guided by a wooden handrail, he has a faint recollection of playing with wooden soldiers when a boy, and he is fully aware that one day he will be laid to rest in a coffin of wood drawn in a hearse likewise constructed of wood.

It would, indeed, be a strange world without our wondrous wood!

— *The Timber Trades Journal.*

2. Ply-wood Notes:–

(a) New U. S. Plywood Product.

A United States plywood manufacturing concern have just placed on the market a new product called "Kraftwood." It is produced from rotary cut Douglas fir plywood, whose figure has been entirely transformed by passing the veneer through a special incising machine. Following the special surface treatment, the plywood is immersed in a resin sealer, which reduces moisture absorption and reduces the tendency of the panel to buckle at the joints. The sealer further provides a priming coat for stains and paints.

Incising of rotary cut Douglas fir plywood, it is claimed, not only gives an interesting decorative effect, but also tends to eliminate surface checking and raised grain. The process apparently equalises the natural expansion and contraction of the wood.

Kraftwood is available in either a plain surface or standard tooled designs grooved in the wood. Six standard wall and ceiling designs are offered.

Kraftwood is recommended for remodelling rooms, finishing attics, basements, kitchens, etc., and for various purposes in offices and other places.

(b) Prevention of Warping.

A user of plywood states that he has sometimes had trouble with plywood through the material warping on the finished job. This has happened despite the fact that he has stocked the panels for a considerable period in a perfectly dry place.

Plywood sometimes warps on the finished job because, although painted or polished with elaborate precaution on the side that shows, the back has been left untouched and exposed with the result that one side of the panel is left to absorb the moisture from the atmosphere, which causes warping. He is advised in a contemporary that the back of a panel should always be given a coat of paint to close the pores of the wood, even if that side is to be covered. Plywood manufactured by means of the dry method will be perfectly flat, pliable and close-grained, taking stain and polish without trouble. Panels made by the wet process are more likely to be bumpy, open grained and liable to warp.

(c) Expanded Rubber and Veneer Facing.

There is now on the market a product described as expanded rubber, which is sold under two trade names—"Onazote" and "Rubatex." The material can be faced with veneer or plywood and is said to be an ideal substance for all kinds of panelling, partition walls and doors. A door made of "Onazote" in the office of Lord McGowan, head of Imperial Chemical Industries, Ltd., weighs only 15 lbs.

Expanded rubber possesses various properties including that of sound absorption. It is first made soft by mastication and then into it is forced nitrogen gas under high pressure. A very light but strong expanded material is obtained; it is actually a solution of nitrogen in rubber consisting of millions of minute gas cells. Other uses embrace aeroplane struts, wings and seaplane floats.

3. Game Sanctuaries or National Parks.

The subject of the preservation of the wild fauna of the world, especially in those parts where for a variety of reasons there exists grave danger that interesting species may under the actions of man be exterminated, has been before the public on several occasions lately. The well-known national parks in the United States and Canada are often quoted as examples to be followed elsewhere. It is true that on a far smaller scale both

national park and fauna (and flora) sanctuaries can be formed—even in the small island of Great Britain; and evidence shows that steps are being taken to give effect to so desirable an object.

It appears to be a curious fact that in the British Empire such suggestions have met with little response until lately, either in Asia or Africa. That position is now also being rectified in some degree. In India the subject of fauna preserves has been ventilated for a number of years. In fact, fauna sanctuaries have been in existence since early in the present century.

The commencement was made in Assam, for the protection of rhinoceros, bison, buffalo and elephant; though the latter has been under protective laws in British India for decades. About 1908–10 a fauna sanctuary was formed, under the auspices of Sir John Hewett, Lieutenant-Governer of the United Provinces, in the great sal forests at the foot of the Himalaya in these provinces. At the time there was a considerable divergence of opinion as to whether the sanctuary should be permanent or only for so many years, after which it would be opened to shooting and another area closed.

As a result of these early attempts and the more modern ideas attached to a national park which have been given ventilation in the Press of late years, in the spring of 1934 Lord Hailey, at the time Governor of the United Provinces, suggested that the Forest Department should make proposals for the creation of a game sanctuary or national park on the lines recommended by the International Conference of 1933, that is, a national park to be created by legislative authority. The area selected for the park is in the famous and beautiful Patli Dun and the hill forests to the south of it in the Ramganga Valley, situated at the foot of and in the foothills of the Himalaya somewhat to the east of the River Ganges. The total area selected is about 125 square miles.

A Bill, the first of its type in India, was drafted. The United Provinces National Parks Act, 1935, was finally passed by the Legislative Council and received the assent of both Governor and Governor-General. Its provisions are very wide. For example, 'animal' is defined as 'any mammal, reptile (excluding snakes, except python) or bird'; and it is an offence "to kill, injure, capture, or disturb any animal or to take or destory any egg or nest of any bird." Permits have to be obtained by anyone wishing to enter or reside in the Park. Photography is

permitted, but no flashlight apparatus may be taken in. Roads are projected in order to make this area freely accessible to the public.

Since the Patli Dun has long been famous for its tigers and leopards, it will be of interest to note any changes which may take place in their habits and attitude towards man, when the Park, which to date has seen little save the forest officer, timber contractor and hot weather shooting and fishing parties, becomes frequented by the holiday-maker and tourist.— *Nature 9-10-37.*

4. Attitude and Concealing Coloration.

I followed with much interest and amusement a controversy in NATURE concerning the origin of species which involved the meaning of protective coloration in insects. One correspondent asserted that insects placed themselves in special locations with which their concealment devices blended. I am submitting a further example of this.

We have in New Zealand a tree-lily or palm-lily, *Cordyline australis*, related to the dragon-trees, and known to us as the cabbage-tree. A looper caterpillar lives in and on its green erect crown, and the moth, *Venusia verriculata*, from this caterpillar lies concealed by day in the dead, strap-like leaves that hang like a rustling skirt around the trunk.

Other observers have noted that whenever they have found the moth thus at rest it was so oriented on the leaf that its brown paralled markings lay along the paralled veins of the dead monocotyledonous leaf. But last summer I was lucky in finding so many on one particular tree that I could stir them up with a straw, and observe that whether they flew or just crept to another leaf, they always, after a few compass-like vacillattions, lay down finally with the body across the leaf, so placing wing-lines along leaf-veins. The body is pressed very close, and the antennæ bent in under the forewings. The moth was coaxed on to a length of leaf, and moved into a prefocused position. It has not closed its wings quite as perfectly as usual, but it can be seen that their lines would otherwise be contuned straight across thorax and abdomen and just about paralled with the leaf-veins, which they match very well in colour.

This is, so far as I can find, the first time the actual movement, appearing strikingly purposive, has been observed, or even the live insect photographed more or less *in situ*.

—J. J. S. CORNES.

* * *

The part played by living insects in adopting attitudes which increase the effect of the colour and pattern is often overlooked in discussing the relation of coloration of insects to natural selection. Mr. J. J. S. Cornes has given a striking new example from New Zealand of a phenomenon recorded by Mr. A. H. Hamm, for English moths when resting on the bark of trees. It was recorded that the vast majority of the individuals of the common winter moth, *Hybernia leucophearia*, rest with the body horizontal, so that the lines of pattern on the wings are brought into parallelism with the dark shadows in the abundant vertical cracks of the bark on which they rest. If the wings were spread horizontally, as is so often the case with moths of this group, the main lines of the pattern would cut across the main lines of the background.

The same principle was shown to apply to the resting attitudes of other species in a latter paper. It is quite obvious when one witnesses such a case that the insect is under the influence of a strong instinct and that until it has adopted the attitude described it is uneasy. The same thing has often been noted with the butterfly *Eronia cleodora* in Africa, of which the underside resembles the blotched green, yellow and brown appearance of a partially dead leaf. Specimens disturbed from rest among vegetation have been seen to settle among the leaves on a plant which show the same mottled coloration rather than among healthy and entirely green leaves.

—G. D. HALE CARPENTER.

—*Nature 16–10–37.*

5. The Technical qualities of wooden sleepers compared to the qualities of metal or concrete sleepers.

BY M. J. CAMPREDON.

Head of the experimental laboratories of the National Institute Du Bois.

A.—THE TECHNICAL QUALITIES OF WOODEN SLEEPERS.

At the present day the wooden sleeper appears to be the one which responds in the most perfect manner to the technical requirements of the case. Let us examine its qualities. 1. For a relatively light weight it occupies a considerable volume permitting — (*a*) a good seat in the ballast, stabilising transverse movement in the sleeper; (*b*) a large surface which distributes the load, thereby loosening the pressure on the ballast,

2. Made of an easily worked material it is easy to obtain various length and sizes suitable to the divergent requirements such as main lines, secondary lines, crossing, etc., 3. It permits the ready attachment of rails and resists the lifting strain on the spike. 4. It gives remarkable elasticity which can be increased by bearing plates between rail and sleeper and a good resistance to vibration caused by the passage of trains. Wood does not present the inconveniences of metal due to fatigue.

Such are the technical qualities of the wooden sleeper. This total of qualities does not appear to have been reached at present by other classes of sleepers.

B.—Other types of sleepers.

1. Attempts made to substitute a concrete for a wooden sleeper do not appear for a moment to have given satisfactory results. In order to reduce weight it has been necessary to reduce sizes and by thus reducing stability to introduce special types of construction which enhance the price. The poor elasticity of concrete resits badly the vibrations caused by the passage of trains and shows a tendency to disintegrate. The action of frost seems to be equally harmful and finally the attachment of the rails is difficult and requires special arrangements.

2. Metal sleepers represent a much more acceptable solution. Presenting somewhat less resistance to the ballast by reason of its smaller dimension than wood nevertheless the metal sleeper offers equally good elasticity and an excellent resistance to vibration. The fixing of the rails, although less easy than with wooden sleepers, has been solved in several interesting ways although these have added to the cost.

As a disadvantage of the metal sleeper must be noted the excessive rusting in a wet or maritime climate. Much more important than this, however, is the fact that varied length and sizes are much more difficult to obtain than in the case of wood. On permanent ways equipped with metal sleepers it is necessary to resort to wooden sleepers for crossings.

C.—General conclusions.

It follows from the preceding consideration that the substitution of the wooden sleeper by the metal or concrete is not to be commended on purely technical grounds. On the other hand it is economic considerations which will decide the question.

In France the menace of the eviction of the wooden sleeper does not apper to be serious. The state has only made small experiments in this direction on secondary lines at the demands of the manufacturers.

In Belgium, on the contrary, where economic conditions are different, a great effort has been made by the metal interests to obtain a substantial footing.

Indo-China, where the metal permanent way has recently become of some importance, can equally be given as an example of the influence of particular conditions on the evolution of ideas. Although possessing sleeper woods in considerable quantities the administration has equipped all the new lines with metal sleepers. The reason being that construction was carried out on a budget of payment in kind, and it was more economical to import metal sleepers. It may be noted in passing that in Annam on the sea coast metal sleepers are rapidly rusted and have had to be replaced by wooden ones.

D.—FUTURE OF THE WOODEN SLEEPER.

It appears that the wooden sleeper on account of its characteristics will for long maintain its technical superiority over metal or concrete sleepers. But in spite of such technical superiority on account of the improvements which are possible in future the wooden sleeper cannot maintain itself against its competitors unless economic conditions are equally in its favour. On this account the question of durability is of paramount importance. It is towards an increase in the life of the sleeper either by a fight against disintegration or mechanical wear and or tear or by the perfecting of process of wood preservation against decay that our efforts must tend. Price is directly bound up with the question of durability. The life of a metal sleeper cannot be fixed, with precision, as we are still in the experimental stage. But it is probable that on this ground the battle will be fought out. It is therefore of fundamental importance if the wooden sleeper is to win that the quality of sleepers should receive the strictest attention. After this the life of the wooden sleeper will depend on the preservative treatment given them. It is towards such methods of conservation that we should proceed in future if we wish to maintain the superiority of the wooden sleeper.

— *Indian Forester, November 1937.*

6. Museums and the People :

At the present time, museums, taking them all in all, are undergoing an interesting and critical stage of development. Some began and remain as collections of curios and some have degenerated to that condition, but the majority are striving in one way or another to test the reactions of the community, in efforts to discover the lines which hold out most hope of stimulating interest. The success or failure of these efforts is a matter of moment to the people as well as to the museums themselves, for upon it depends the place which museums are to take in the life of the community as centres of education and of intellectual and aesthetic pleasure. For many of our local museums, perhaps for most, this place is still undecided, and accordingly advice upon the most promising lines of progress by a museum official of experience and standing ought to fall upon open ears.

At the Newcastle conference of the Museums Association held in July, Dr. W. E. Swinton of the British Museum (Natural History), in a paper which has appeared in the *Museums Journal* (September), gave sound advice upon the improvement of collections. He justly pointed to the hesitancy of many municipalities to give proper financial backing to the museums under their care, a hesitancy to be observed particularly in the appointment of suitably paid curators with knowledge and training for posts which have their own peculiar difficulties and make their own special demands. Thanks to an awakening conscience and to the efforts of the Carnegie United Kingdom Trust, that position is improving, and "many municipal authorities to-day feel, though vaguely it may be, that a natural history museum is somehow an asset to the community".

Granted a suitable curator, what of the collections themselves? In the first place the local natural history museum should concern itself with the objects of its own neighbourhood, and secondly, it should present these in such a way that the visitor should be induced to take a fresh or increased interest in the local fauna, flora and geology. That implies ruthless elimination of surplus specimens, so that room may be gained for a few well-selected groups in natural habitats, well lit and clearly, instructively and yet simply labelled.

Dr. Swinton properly suggests that no zoological series is complete without the inclusion of fossil forms in their systematic position, presumably to illustrate the course of evolution. But

why not take the bull by the horns and arrange selected series specially to illustrate evolution and other general truths, for that would be education at its best; and the ordinary visitor who could visualize evolution from the systematic exhibits of most museums would be a miracle himself. The time will come when systematic collections, except for the merest skeleton of classification and other defined purposes, will be relegated to cabinets where identifications and detailed comparisons can best be made, and galleries will largely be given over to exhibits which stimulate observation of the habits and adaptations of living things, and which lead visitors gently to appreciation of the great truths which lie behind structure and development and evolutionary progress. J. R.

— *Nature, 23–10–37.*

7. The largest Banyan tree (170 years) :—

The Sibpur gardens, Calcutta contain the largest Banyan tree in the Orient—a tree which is a veritable forest in itself with 601 aerial roots actually in the ground. It once measured 1000 ft. in circumference at its crown, but during the past fifty years or so cyclones and the disintegrating effect of many monsoons have sadly changed its form and reduced its beauty. As a matter of fact for a quarter of a century there has been a mighty battle between Nature and man, for the botanists of the garden have done everything fo save the noble tree. * * * * *

This old banyan which was quite small when the gardens were established started life as a shoot on the top of a wild date-tree, under which there sat an old fakir. Its real age of course is not quite known, although from observations made of its actual growth since 1871, and from the rate of growth of other banyans it is believed to be even more than 169 years old.

— *The illustrated Weekly of India.* 13–3–38.

8 Wood-Work as a Rural Industry.

Organisation on a Co-operative Basis Essential: Possibilities in India.

New Delhi, December 31, 1937: The following Press note on 'Wood work as a new rural industry has been issued by the Director of Public Information :—

Wood-working offers possibilities of a new rural industry, and the Indian villager who has generally no work to do when the field season is over, might have in it a suitable spare time occupation.

This is the idea which the Forest Research Institute at Dehra Dun commends to all those interested in rural development, in one of their booklets entitled "Manufacture of Small Dimension Stock : A New Rural Industry", in which an outline is also given of the scheme on which this idea is worked out.

The possibilities consist in the manufacture of what is called " small dimension stock" by practically unskilled labour in rural areas, for which no greater capital investment is required than is necessary for the purchase of a hand saw and a wood axe. His skill and sound commonsense, and the frugality of which the average illiterate Indian villager is capable of will be his greatest capital assets in starting on this new venture.

'In Germany, Austria, Czechoslovakia and Holland, to mention a few only among the European countries, the use of small dimension stock has become extensive. Japan has followed suit and she is importing into India small dimension stock for packing cases and crates. She has been making tennis rackets with small waste pieces of different timbers. In other countries, in France, Germany and Japan, for instance, farmers engage themselves on the manufacture of "small dimension stock" during about six months of the year when they have not much work in the fields. The peasant may also follow suit and make the best use of his time which otherwise goes waste.

What is "Small Dimension Stock"?

The expression " small dimension stock" originated in the United States of America. It refers to wood pieces of different standard sizes, generally varying in thickness and width between 1/2" and 6" and in length up to 3 feet. This stock has a ready market in towns and cities where wood-working factories and workshops, including turneries, may be already located. The stock may be straight or rectangular in cross section, or it may be curved or bent and may be of different cross-sectional and longitudinal dimensions. In more general terms, small dimension stock is wood planking of small sizes that can be cut from slabs and trimmings, or peices from small logs or branches of different irregular sizes.

In India, the small dimension stock idea is already current, although only in an embryonic form (e. g. in wheel parts and bed-legs), but a more scientific, systematic and extensive production of small dimension stock has enormous potentialities for the reduction of timber waste to a minimum and for the starting of a new rural industry of far-reaching importance.

The communique after giving a number of articles which can be made of wood states :

There are various sources of raw material for the manufacture of small dimension stock. Small and irregular pieces of timber left over during conversion of large logs into sleepers, building timber and also branch wood are important sources. Such pieces are now usually consigned to the fire. Practically any kind of wood, hard wood or soft wood; which is available in the forests will be suitable. The villager can purchase crooked and knotty logs from the neighbouring forest and after cutting out the defective portions he can make the best grades of small dimension stock. The north-west of Bombay Presidency, in the Central Provinces, Bihar and the Central Indian States the trees are of stunted growth so that the boles are usually crooked. Such legs fetch at present a very low price. There is also the branch wood of timbers like Shisham. Use can be made of all these.

It is no exaggeration to say that over 95 per cent of the timber that is required in practically any wood using industry is included within the limits of size of small dimension stock.

In an actual survey of timber used in wood industry in America, it was revealed that only 1 per cent. is employed in over 5 inches width or thickness, and over 8 feet in length. Again, over 50 per cent of the timber used in American wood industries was found to be less than four inches square and two feet long. It would, therefore, appear that there is a very large field for the use of small dimension stock in wood industries. The manufacturer of such stock requires the most elementary skill and only the poorer grades of timber.

The skilled village carpenter or village turner can make the more complicated or finished forms of small dimension stock like bent or curved stock for felloes or tonga rims, certain toys, sporting goods, also turned articles such as ornamental legs for chairs, beds, etc., toys, chessmen, wood tops, yo-yo, cups, etc. Already there are dotted throughout the country several villages where there are professional wood turners who even now turn out articles of excellent finish with comparatively simple and crude locally made tools.

Production and Market.

In order that the industry may succeed it should be organized on a co-opertive basis. For the guidance of and facilitating the villager to find a ready sale for the product of his labour, a liason salesman who could be trained at the Forest Research Institute, Dehra Dun, may be provided. The villager should be saved the worry of finding a market for the small dimension stock he produces. He should be taught to produce sizes and shapes that would find ready sales in the towns and cities. Details are given in the pamphlet of several possible standard sizes that may be expected to command a ready market.

By the inauguration of a scheme like the one proposed, not only will the timber waste to reduced to a minimum but also remunerative employment found for the villager for his spare time. As the material will be manufactured with inexpensive rural labour from waste timber, it should be easily able to compete with such stock cut in towns and cities by expensive labour from costly large sized logs. There would be no danger of competition from machines as no machine can rival man for the exercise of the necessary judgment in cutting crooked logs at proper places and cutting out defective timber with the minimum of waste.

9. New methods of soil cultivation.

Considerable progress had been made in recent years in regard to determination of the best period for ploughing, factors which are highly important in the improvement and rationalization of methods of cultivation.

The International Institute of Agriculture at Rome, has recently published in the "International Review of Agriculture" a study describing the results obtained in respect of ploughing technique.

The article lays special stress on the form and type of the ploughs employed, a matter of fundamental importance in the proper ploughing of the soil. Ploughs vary greatly in form and in type as between one country and another and also as between one district and another. Some very important improvements have recently been made in this respect and the substitution of the plough by other implements and through the use of new ploughing methods is under consideration.

Among the implements whereby in many cases it is possible to replace the plough and other implements used for the

supplementary preparation of the soil may be mentioned rotary tillers, pulverator ploughs, sub–soil ploughs and cultivators with rigid prongs.

— *International Institute of Agriculture, Press service.*

10 A New Fire Resisting Paint.

An interesting new fire resisting paint has recently been produced by Palorit Paints Ltd., London, and it is claimed that this paint offers the maximum protection against fire to wood structures, while permitting all the decorative effects associated with ordinary paint finishes. A recent test which was held at the White City Stadium demonstrated the efficiency of this paint as two timber structures filled with shavings soaked with petrol successfully resisted the fire lit inside them, while two other similar structures which had not been painted with Palorit were completely destroyed. The paint is available in matt and glossy finishes, and has a large covering capacity. It wood seem that its use would be worth investigation on the part of those interested in the fire-proofing of timber structures.

— *Wood, December 1937.*

11. Exhibition galleries.

In certain modern museums, the *'travelogue'* idea has been applied in the scheme of arrangement. The principle is that the exhibits of products, the dioramas & models & the photos, pictures & transparencies that go to the furnishing of a court are so arranged that the eye of the visitor is taken with just those scenes & industries that would be met with on an actual tour of the country.

The "story" method of dispay — a new technique:— The point aimed at is the driving home in young people & in the non-technical visitor of riper years, easily assimilated facts regarding the origin of some article of common use everyday life & its connection with the producer overseas. To this end the raw material employed is shown & is followed through the various stages of manufacture to the finished product each stage being represented by specimens of material and photos of the machines employed. By this means the over–seas producer is linked with the home manufacturer, the interlocking of a number of industries to one end is illustrated and facts regarding the geographical sources of the supply of raw materials are impressed on the memory in a way that makes the study of Empire geography a pleasure rather than a subject for tears.

— *Imperial Institute Annual Report, 1936.*

Notifications relating to Rangers.

18—9—37. The following promotions of Rangers are ordered :—

I. *With effect from 1—4—1937 vice M. R. Ry., T. M. Duraiswami Pillai Ranger, Third Grade, retired from service* :

(1) Mr. M. Rama Rao Kini, from third grade, ***sub protem*** to third grade permanent (2) Mr. B. V. Nagaraja Ayyar, from fourth grade, permanent to third grade, ***sub protem*** (3) Mr. B. V. Vaideeswara Ayyar from fourth grade, ***sub protem*** to fourth grade permanent. (4) Mr A Bhavayya, from fifth grade, permanent to fourth grade, ***sub protem*** (5) Mr P A. Madhavan from fifth grade, ***sub protem*** to fifth grade permanent. (7) Mr. T. N Vedantharamanujam from sixth grade, ***sub protem*** to sixth grade permanent. (8) Mr. A Sitharama Sarma from seventh grade, permanent to sixth grade, ***sub protem*** (his promotion will not take effect until 15th April 1937). (9) Mr. Y. Subrahmaniyam Naidu, from seventh grade S.P.T. to seventh grade permanent. (10) Mr. M. B Kalappa, temporary Ranger to seventh grade ***sub protem***. (11) Mr. Marcel D' Souza from Ranger, to Temporary Ranger. (12) Mr. S Muthukrishna Naidu, Acting Trained Forester to act as Ranger, last grade.

II. With effect from 1-4-1937, vice, Ranger K.M. Gopalachari IV Grade, retired from service :—

(1) Mr. B. M. Coates from fourth grade, ***sub protem*** to fourth grade permanent (3) Mr. N S. Ayyanna from fifth grade ***sub protem*** to fifth grade permanent. (4) Mr. K. Raghavan from sixth grade permanent to fifth grade ***sub portem*** (5) Mr. V. N. Parathasarathy Naidu, from sixth grade ***sub protem*** to sixth grade permanent. (6) Mr. Abdul Razack, from seventh grade permanent to sixth grade ***sub portem***. (7) Mr. Gulab Singh, from seventh grade, ***sub portem*** to seventh grade permanent. (8) Mr. M. Gopalaswami Naidu. Temporary Ranger, to seventh grade ***sub protem***.

III. With effect from 12-7-1937 vice Mr. C. Tiruvengadam Pillai, Ranger, sixth grade invalided.

(1) Mr. A. Sitharama Sarma from sixth grade ***sub protem*** to sixth grade permanent. (2) Mr D. V. Nagaratnam from seventh grade permanent to six grade ***sub protem***.

IV. With effect from 16-8-1937 vice Khan Sahib K. Kunhirayan Sahib, Ranger, First Grade, retired:—

(1) Mr. N Sundaresa Ayyar, from second grade, permanent to first grade, permanent. (2) Mr K. P. Chathu Nair, from third grade permanent to second grade, permanent (3) Mr. B. V Nagaraja Ayyar, from third grade ***sub protem*** to third grade permanent

(4) D. E. Lewin, from fourth grade, permanent to third grade ***sub protem***. (5) Mr A. Bhavaya, from fourth grade ***sub protem*** to fourth grade permanent. (6) Mr. P. Ramaswami Ayyar, from fifth grade, permanent to fourth grade ***sub protem***.

28—9—37. The following promotions of Rangers are ordered:—

I. With effect from 16-3-1937, vice Ranger B. H. Anandathirtha Rao, III grade, on other duty as Assistant Chenchu Officer :—

Mr. T. Venkatasubbayya, from fourth grade permanent, to third grade, S. P. T.

II. With effect from 16-8-1937, vice an existing vacancy in the IV grade :—

(1) Mr. A. M. Srinivasan, from fourth grade S. P. T. to fourth grade, permanent. (2) Mr. C. R. Raghunathan from fifth grade, permanent, to fourth grade S. P. T. (3) Mr. M. P. Philip, from fifth grade S. P. T. to fifth grade, permanent (4) Mr. P. Kannan, from sixth grade permanent to fifth grade S. P. T. (5) Mr. Abdul Razack from sixth grade, S. P. T. to sixth grade permanent. (6) Mr. M. B. Kalappa from seventh grade S P. T. to seventh grade permanent and sixth grade S. P. T. (7) Mr. T. R. Rajagopalan, Temporary Ranger, to last grade S. P. T. (8) Mr. C. Muthukrishna Naidu. Acting Ranger, to be temporary Ranger. (9) Mr. M. Narayanan Nambiar, trained Forester, to act as Ranger, last grade.

III. With effect from 23-8-1937, vive Mr. P. A. Madhavan, Ranger, V grade, deceased.

(1) Mr. K. Raghavan, from fifth grade, S. P. T. to fifth grade permanent. (2) T. Balaramaswami Naidu, from sixth grade, permanent to fifth grade S. P. T. (3) Mr. D. V. Nagaratnam, from sixth grade S. P. T. to sixth grade, permanent. (4) Mr. M. Gopalaswamy Naidu, from seventh grade S. P. T. to seventh grade, permanent and sixth grade S. P. T. (5) Mr. P. Shunmugasundaram Pillai, temporary Ranger to seventh grade, S. P. T.

27—10—37. The following untrained Foresters are promoted as temporary Rangers with effect from dates on which they assume charge of Rangers' duties.

1. T. Venkataramiah, II Grade, Waltair Circle.
2. T. Naganna, II Grade, Waltair Circle.

2. Their pay should be regulated with reference to the rules issued in G. O. No. 311, Public (Services) Department dated 13-4-1933.

19—11—37 The following promotions of Rangers are ordered :—

I. With effect from 6-9-1937 vice Ranger G. V. Subba Rao, V Grade, retired from service :-

(1) Mr. P. Kannan, from fifth grade sub protem to fifth grad permanent. (2) Mr. K. Venkatesam Naidu, from sixth grade pere manent to fifth grade sub protem. (3) Mr. M. B. Kalappa, from sixth grade sub protem to sixth grade, permanent.

II. With effect from 21-9-1937, vice Ranger D. Krishnaswamayya, V Grade, died:—

(1) Mr. T. Balaramaswami Naidu, from fifth grade, sub protem to fifth grade, permanent. (2) Mr. B Kotilingam, from sixth grade permanent to fifth grade sub protem. (3) Mr. M. Gopalaswami Naidu, from sixth grade, sub protem to sixth grade, permanent

III. With effect from 15-11-1937, vice Ranger Antony Culas, II Grade retired from service :—

(1) Mr. T. Paramasivam Pillai, from third grade permanent to second grade, permanent. (2) Mr. D. E. Lewin, from third grade, sub protem to third grade permanent. (3) Mr. U. Vriddachalam Pillai, from fourth grade permanent to third grade sub protem.

IV. With effect from 16-11-1937 vice Ranger P. Dhananjaya Rao, reduced from the III to the IV Grade :—

(1) Mr. T. Venkatasubbayya from third grade sub protem to third grade, permanent. (2) Mr. A. B. Fenn, from fourth grade, permanent to third grade sub protem.

V. With effect from 16-11-1937 vice Ranger T. G. Sitharam Mudaliar reduced from the sixth to the seventh Grade :—

Mr. V. Rangachari, from seventh grade, permanent to sixth grade permanent.

VI. With effect from dates on which they assume charge of Rangers' duties, the following Foresters are promoted as officating Rangers last grade in existing vacancies.

(1) Mr. V. Maragathavelu. (2) Mr. K. A. Muddayya, M.R.H 1934 (3) Mr. P. J. Krishnan. (4) Mr. M. D. Pichai Pillai, M.R.H 1934. (5) Mr. K. V. Lakshmikanta Rao.

2—2—38. The following promotions of Rangers are ordered :—

(1) Mr. U. Vriddachalam Pillai, from third grade S. P. T. to third grade permanent. (2) Mr. I. Z. Robert Paul from fourth grade permanent to third grade S.P.T., (3) Mr. P. Ramaswami Avyar, from fourth grade S.P.T., to fourth grade permanent. (4) Mr. A. Muthukrishnan from fifth grade permanent to fourth grade S. P. T. (5) Mr. K Venkatesam Naidu from fifth grade S. P. T., to fifth grade permanent. (6) Mr. M V. Genesan, from sixth grade, permanent to fifth grade S.P.T. (7) Mr. P. K. Sankara Menon, trained Forester, to officiate as Ranger last grade.

The promotions ordered in chain sixth in this office Ref. dated 19-11-1937, will be given effect to from 14-12-1937 in respect of the following men.

(1) Mr. V. Maragathavelu. (2) Mr. K. A. Muddayya. (3) Mr. M. D. Pichai Pillai. (4) K. V. Likshmikanta Rao. As regards Mr. P. J Krishnan, referred to in the above reference, his promotion will take effect from the date on which he actually assumes charge of Rangers' duties after his reversion from foreign service,

(2) Mr. P. Shanmukasundaram Pillai, Ranger seventh grade S P. T. is confirmed as Ranger seventh grade in an existing vacancy with effect from 22-8-1937.

13—3—38. The following promotions of Rangers are ordered :—

I. With effect from 18-11-37 in the vacancy caused by the reduction of Ranger S. A. Dawson.

(1) Mr. A B. Fenn from the III Grade Sub-protem to III grade permanent. (2) Mr. Y. Peddalakshmayya Naidu from fourth grade permanent to III Grade S. P. T. (3) Mr. C. R Raghunathan from fourth grade S. P. T. to fourth grade permanent. (4) Mr. M. Subba Rao from fifth grade permanent to fourth grade S. P. T. (5) Mr. B. Kotilingam from fifth grade S. P. T. to fifth grade permanent. (6) Mr. J. S. Vedanayagam from sixth grade permanent to fifth grade S. P. T. (7) Mr. M. P. Halasyanatha Ayyar from seventh grade permanent to sixth grade permanent.

II. With effect from 18—11—37 in the vacancy caused by the reduction of Ranger G. Rama Rao.

(1) M. I. Z. Robert Paul from third grade S. P. T. to third grade permanent. (2) Mr. K G. Monnappa from fourth grade permanent to third grade S. P. T. (3) Mr. A. Muthukrishnan from fourth grade S. P. T. to fourth grade permanent, (4) Mr. K. Jayaram Ayyar from fifth grade permanent to fourth grade S. P. T. (5) Mr. M. V. Ganesan from fifth grade S. P. T. to fifth grade permanent. (6) Mr. S. Narayanaswami Ayyar from sixth grade permanent to fifth grade S. P. T. (7) Mr. S. Rangamannar Das from seventh grade permanent to sixth grade permanent.

III. With effect from 9—2—38 in the vacancy caused by the reduction of Ranger C. G. Krishna :—

(1) Mr. Y, Peddalakshmayya Naidu from third grade S. P. T. to third grade permanent. (2) Mr. K. K. Appayya from fourth grade permanent to third grade S. P. T. (3) Mr. M. Subba Rao from fourth grade S. P. T. to fourth grade permanent. (4) Mr. A. N. Ponnayya from fifth grade permanent to fourth grade S. P. T. (5) Mr. J S. Vedanayagam from fifth grade S. P. T. to fifth grade permanent. (6) Mr. I. John from sixth grade permanent to fifth grade S P. T. (7) Mr. Y. Subrahmania Naidu from seventh grade permanent to sixth grade permanent.

2. As a set off against vacancies in higher grades and with a view to have the full compliment of men the following officiating promotions to the last grade of Rangers are ordered.

(1) Mr. V. K, Kunhiraman Nambiar. (2) Mr. N. C. Madappa (MRH). (3) Mr. S Narayana Naik.

The dates from which this promotion is to have effect will be decided on receipt of information as to the dates of their assumption of charge of Rangers' duties. The Conservators concerned are requesteed to report on this point.

Their officiating pay should be regulated with referene to the rules issued in G. O. No. 169 Public Services dated 29—1—38.

Waltair Circle.

13—10—37 Mr Abdul Razack, Cherla Range. Godavari Upper division, on relief by Mr. C. T. Tiruvengadam, to Polavaram range. Godavari Lower division

31—10—37 Mr. K. Subbanna, to charge of Narasapatam range, Vizagapatam district, in relief of Mr P Dhananjayarao, whose services are lent to Venkatagiri Estate.

8—11—37. The following postings of untrained Foresters promoted as temporary Rangers are ordered:— 1. Mr. T. Venkataramiah. Forester, second grade, Nellore to charge of Narasapatam South Range, Vizagapatam Division in relief of Mr K. Subbanna, trained forester third grade Mr. T. Nagana, Forester second grade Godavari Upper. Division to charge of Nugur Range, Godavari Upper Division in relief of Mr. C. S. Sivagnanam, trained Forester third grade.

19—11—37. Mr. N. Chakrapani Iyengar, Rapur Range, leave from date of relief till 14-2-1938. 2. Mr. V. Rangachari, Sathiavedu Range, to Rapur Range, *vice* No 1. 3. Mr. K. A. Muddayya, Udayagiri Range, to Sathiavedu Range, *vice* No. 2. 4. Mr. Venkataramiah, to Udayagiri Range. *vice* No. 3.

7—12—37. The following postings of Rangers are ordered. 1. Mr. A. Surya Rao Naidu, to Sathiavedu Range, 2 Mr. V. Rangachari, Rapur Range, additional charge of Sathiavedu Range, in relief of Mr. K. A. Muddaya. 3. Mr. C. S Sivagnanam, to Peddapur Range, Godavari Lower Division in relief of Mr. N. S. Eswara Ayyar.

26—12—37. Mr. Ch. Rama Murti, on return from leave on 3-1-38 to Narasapatam South Range, Vizagapatam Division.

4—1—38. Mr. K. Subbanna Narasapatam South Range, on relief by Mr. Ch. Ramamurthy to Sathivedu Range, Nellore Division.

12—1—38. Mr. Ch. Ramamurthy. Narasapatam, extension of leave for 2 months in continuation of the leave granted.

17—1—38. Mr. S. M. Ansur Ali, on return from leave on 22-1-1938 to Lakkavaram Range. Godavari Upper Division. 2. On relief, Mr. Ahmed Sheriff, to Sathiavedu Range.

27—1—38. Mr. A. Surya Rao Naidu, Polavaram Range, extension of leave for two months from 20-12-1937 in continuation of the leave granted.

31—1—38. Mr. P. Gopalan, on return from leave to Polakonda Range. 2. On relief, Mr. P. Chengalreddi, leave for two months.

8—2—38. The following postings of Rangers (Nos. 1 and 2 reverting from Orissa to Madras in April 1936) are ordered:— 1. Mr. M Narasinga Rao Naidu, to Rajahmundry Range, Godavari Lower Division. 2. Mr. K. Venkatesam, to Narasapatam North Range, Vizagapatam Division. 3. Mr. M. Subba Rao, Range officer Rajahmundry Range Godaveri Lower Division on relief by No. 1 to Narasapatam South Range.

9—2—38. Mr. Ch. Ramamurthy, for special duty for 6 months in connection with the classification of the unreserves in Narasapatam North Range.

26—2—38. Mr. C. G. Krishna, reinstated in G. O. dated 9-2-1938 as Ranger sixth grade, posted to Vinnukonda Range, Guntur Division. 2. On relief, Mr. I. Sambasiva Rao Naidu, to Peddapur Range, in relief of Mr. C. S. Sivagnanam, Trained Forester.

17—3—38. Mr. M. Subba Rao, Rajahmundry Range, to Narasapatam South Range, Vizagapatam Division. 2. On relief, Mr. K. Subbanna, Trained Forester to charge of Rajahmundry Range Godavari Lower Division.

17—3—38. Mr. C. G. Krishna, reinstated as Ranger sixth grade with effect from 13-10-36 in G. O. dated 9-2-38 leave on half average pay from 13-10-36 to 28-2-1938. The leave from 1-3-38 to date of joining in Guntur Division will be granted later.

Bellary Circle.

22—8—37. Mr. G. Devanayagam Naidu, Markapur Range, to Ganjivaripalli, 2. Mr. N Umapathi Mudaliar, Ganjivaripalli Range, Kurnool East Division, to Markapur. Mr. Ansar Badshah Sahib, to Dornal Range, Kurnool East Division. 4. Mr. T. Balaramaswami Naidu, on relief, to Kanigiri.

28—8—37. Mr. T. M. Krishnamachari, to Sivapuram Range.

21—9—37. Mr. K. Tiruvenkatachari, to Sirvel Range of Kurnool South Division.

27—10—37. Mr. A. Vyasulu, on return from leave on 4-11-37 to Kurnool Range. 2. A. Rahim Sahib on relief by No. 1 to Porumamilla Range, Cuddapah North Division.

31—10—37. Mr. H. Thammayya, on return from leave on 6-11-37, to be Assistant Chenchu Officer *vice*. Mr. B. H. Anandathirtha Rao granted leave.

16—11—37. D. N. Subramania Ayyar, Kadiri Range, Anantapur Division to Dhone Range, Kurnool West Division. 3. Mr. T. Sriramuiu Naidu, to Kadiri Range.

29—11—37. Mr. B. Krishna Rao, Kurnool South Division leave for four months with effect from 18-10-1937.

2—12—37. Mr. Y. Subramaniam Naidu, on return from leave on 18—12—37 to Gundlakamma Range, Kurnool South Division 2. Mr. V. N. Subramania Ayyar, on relief. to special duty in the same Division.

18—2—38. Trained Forester Mr. B. M. Bopayya of Kurnool South Division posted to charge of Hospet Range, Anantapur Division *vice* Ranger Mr. B. T. Sitarama Ayyar applied for leave.

21—1—38. Mr. A. Ranganayakulu Naidu, extension of leave for three months from 17-1-38.

6—1—38. Mr. Y. Subramaniam Naidu, on expiry of leave to be on special duty in the Fodder Division, Bellary. His posting to Gundlakamma Range is cancelled.

12—3—38. Mr. B. Krishna Rao, Ranger, Kurnool South, leave for two months from 18-2-38.

28—2—38. Mr. T. Balaramaswami Naidu, Kanigiri Range, leave for 4 months from the date of relief. Mr. C. J. Nanjappa. Trained Forester, Cuddapah South to Kanigiri Range charge,

28—2—38 Mr. T. Sreeramulu Naidu, Dhone Range leave for three months from date of relief by Ranger D. N. Subrahmanya Ayyar. Mr. N. Sundaresa Ayyar, Madanapalle, will continue to hold additional charge of Kadiri Range until further orders.

18—3—38. Consequent on the transfer of two Rangers from Orissa Province to Bellary Circle with effect from 31-3-38 and one Ranger from Bellary to Salem Circle the following postings are made :—

1. Mr. M. Narasinga Rao Naidu, to Pecheruvu Range, Kurnool West Division. 2. Mr. P. Shanmugasundaram Pillai, on relief by No. 1 to Salem Circle. 3. Mr. K. Venkatesam Naidu, to Gundlakamma Range, Kurnool South Division. 4. Mr. V. N. Subrahmaniya Ayyar on relief by No. 3 to Kadiri Range, Anantapur Division to relieve Mr. N. Sundaresa Ayyar of his additional charge.

15—3—38. Mr. B. T. Sitharama Ayyar, Range Officer, Hospet leave for four months from 6-2-38.

Salem Circle.

22—9—37. 1. Mr. T. S. Sankaranarayana Ayyar, Salem Central division, to Atur range, Salem South Division. 2. Mr. T. N. Vedantaramanujam, to Shevaroys North Range. 3. Mr. J. S. Vedanayagam, to Shevaroys South Range.

6—10—37. Mr. B. S. Ramaswami Ayyar, Vellore East division, to Alangayam Range, Vellore West Division.

2—11—37. 1. Mr. T K. Parthasarathy Ayyangar, Tiruvannamalai Range, leave for four months from date of relief.

2—11—37. On expiry of his leave on 10-11-1937, Mr. K. S. Ramiah, to Gudiyattam Range of Chittoor Division.

3—11—37. On return from leave on 7-12-1937, Mr. B. Ghulam Dastagiri Saheb, posted back to Santhavasal Range.

17—11—37. 1. Consequent on the joining to duty of Ranger Mr. K. S. Ramiah on 15-11-1937 Mr. A Yagnaswami, acting Ranger last grade, will continue to act as Ranger last grade, from 16-11-1937, *vice* Mr. B. Ghulam Dastagiri Saheb.

18—11—37. Mr. Syed Munavar Saheb, Tammampatti Range, Salem South Division, leave for four months from date of relief.

21—11—37. Mr. M. S. Krishnaswami Ayyar, on return from leave on 11—12—37. to Chandragiri Range, Chittoor Division.

21—11—37. Mr. M. M. Ponnappa, Chandragiri Range, leave for for two months from date of relief.

22—11—37. C. B. Ekambaram, Rasipur Range, Salem South Division, additional charge of Tammampatti Range from 19-11-1937.

27—11—37. A. P. Devanayagam, Forester second grade, Salem Central Division, to charge of Cauvery Range *vice* Mr. Muthuswami Ayyar, Ranger on leave.

20—10—37. Mr. V. Narayanswami Ayyar, Gudiyattam Range, leave for three months from date of relief by Mr. T. R. Vijayaraghavan.

7—12—37. Mr. T. N. Vedantaramanjam, Salem South Division extension of leave for two months from 17-12—37. 2. Consequent on the joining duty of Mr. T. S. Sankaranarayana Ayyar, Ranger, on 25-11-37 A. N Mr. C. B. Ekambaram, will continue to act as Ranger last grade, vice No. 1 on leave, or until further orders.

15—12—37. Consequent on the return to duty of Ranger Mr. B. Ghulam Dastagiri Saheb on 6-12-1937 Mr. A. Yagnaswami, Polur Range, will continue to act as Ranger, last grade, from 6-12-1937. *vice* Mr. T. K. Parthasarathi Ayyangar, Ranger sixth grade, on leave for four months with effect from 24-11-1937.

18—1—38 Mr. P. A. Krishnaswami Mudaliar, Vellore West Division, on return from leave on 30-1-1938, to Denkanikota West Range, Salem North Division.

5—2—38. I. Mr. T. N. Vedantaramanujam. Salem South Division, extension of leave for two months from 17-2-1938. 2. Mr. C. B. Ekambaram, Rasipur Range, will continue to act as Ranger, last grade, vice No. 1 on leave, or until further orders.

10—2—38. Mr. P. A. Krishnaswamy Mudaliar, Vellore West Division, extension of leave for one month and 12 days from 30-1-1938. He should take charge of the sandalwood depot, Tirupattur, on expiry of leave. 2. Mr. C. B. Pemmiah, Harur Range, will continue to act *vice* No. 1, on leave or until further orders.

12—2—38. 1. On expiry of leave on 25-2-1938, Mr. V. Naravanaswami Iyer, to Polur Range, Vellore East Division. 2. On relief, M. A Yagnaswami, will continue in Vellore East Division as Forester until further orders.

22—2—38. Mr. M. P. Halasyanatha Ayyar, Sandalwood Sale Depot, Tirupattur, leave for four months from 10-3-1938 or from date of relief.

4—3—38. Mr. M. Muthuswami Iyer, to Tirnvannamalai Range, Vellore East Division, 2. On relief Mr. T.R. Vijayaraghavan, Trained Forester fifth grade, will revert to his permanent post as Forester fifth grade, Salem North Division,

8—3—38. Mr. B. V. Vaideeswara, Ayyar Denkanikota West Range to Krishnagiri Range. 2. Mr. H. E. MacBride, Ranger second grade, in charge of Krishnagiri Range, Vellore West Division, to Denkanikota West Range, Salem North Division.

9—3—38. Consequent on the reversion of Mr. A. Yagnaswamy Trained Forester fifth grade from 4-3-1938, when Mr. V. Narayanaswami Iyer, joined in Polur Range, Mr. T. R. Vijayaraghavan. Trained Forester fifth grade, Tiruvannamalai Range will continue to be in Range charge from 4-3-1938, *vice* Mr. T. K. Parthasarthy Iyengar, Ranger, on leave, and until relieved by Mr. M. Muthuswami Iyer, Ranger.

15—3—38. Consequent on the rejoining to duty of Mr. P. A. Krishnaswami Mudaliar, on 12-3-1938 Mr. C. B Pemmiah, acting Ranger, in charge of Harur Range, will continue to act as Ranger, *vice* Mr. M. P. Halasyanatha Iyer, granted leave for 4 months from 13-3-1938.

16—3—38. Mr. M. Muthuswami Iyer, on return from leave on 17-3-1938 to Cauvery Range. reverting Mr. A. P. Devanayagam, to his permanent post as Forester.

Coimbatore Circle.

14—10—37. Mr. I. John, Coimbatore South, attached to Kollegal Division "to trace new roads". He will be relieved of this special work in time so as to take charge of Udamalpet Range on 16-12-1937, in Relief of Ranger Mr. T. G. Sankaran Nair.

26—10—37. 1. Mr. K. Karunakaran Nambiar, Begur Range, Wynaad Division, leave for four months from 23rd October 1937. 2. Mr. C. P. Bhimayya, temporarily posted to Begur Range until relieved by No. 3. 3. Mr. M, M. Mandanna, on return from leave to Begur Range.

3—11—37. Mr. T. Kondathu Goundar, to Bhavani Range, Coimbatore North Division.

10—11—37. Mr. P. Velayudhan Nair, Natham Rrnge, to additional charge of Ayyalur Range in relief of Ranger Mr. A. Culas who is to retire with effect from 15-11-1937. 2. Mr. S. Venkatarama Ayyar, Coimbatore North Division, will after expiry of his leave on 21-11-1937 to rejoin duty in Bhavani Range in relief of Ranger Mr. T. Kondathu Goundar. 3. On relief by No. 2, Mr. T. Kondathu Gounder, to Ayyalur Range, Madura Division in relief of No. 1.

28—11—37. Mr. P. Ramaswamy Avyar, further extension of leave for 6 weeks from 24-11-1937 in continuation of the leave for 3 months from 24-8-1937.

13—12—37. Mr. R. Alagiriswamy Naidu, extension of leave for 3 months from 3-11-1937.

22—12—37. On expiry of his leave on 4-1-38 Mr. P. Ramaswami Ayyar, to Palni Range Madura Division. 2. On relief by No. 1, Mr. V. Maragathavelu, efficiating Ranger, Palni Range, posted as a temporary arrangement to Tunacadavu Range, as second Assistant Ranger. 3. On relief by No. 2 Mr. Vores Ag. Ranger and second Assistant to the Range Officer, Tunacadavu Range to Bargur Range, Kollegal Division. 4. On relief by No. 3, Mr M. D. Pichai Pillai, [illegible] disposal of District Forest Officer Kollegal.

23—12—37. 1. Mr. T. G. Sankaran Nair, Udumalpet Range, leave preparatory to retirement, from date of relief up to 31-3-1938. 2. Mr. I. John, to Udumalpet Range vice No. 1.

19—1—38. The following officiating promotions of trained Foresters to the last grade of Rangers are ordered :—

1. Mr. F. B. Kunders from 9-1-38 to 31-3-1938 vice Ranger T. G. Sankaran Nair, on leave. 2. Mr. W. Vores from 9-1-38 to 2-2-1938 *vice* Ranger R. Alagiriswamy Naidu on leave.

13—2—38. Mr. C. K. Unni Ranger seventh Grade, Coimbatore South Division granted leave for four months from 1-3-1938 or date of relief.

24—2—38. Mr. V. Govinda Menon, Trained Forester, posted as Ag. Ranger and Assistant to Range Officer Tunacadavu Range, *vice* Ranger Mr. C. K. Unni granted leave from 1st March 1938 or date of relief. He will be acting Ranger from date of his joining duty in Tunacadavu Range up to 31-3-38.

24—2—38. Mr. W. Vores, Bargur Range, Kollegal Division, to continue as acting Ranger *vice* Ranger Mr. R. Alagiriswami Naidu who has extended his leave up to 2-4-1938.

11—3—38. Mr. R. Alagiriswamy Naidu, extension of leave for two months in continuation of the leave for 3 months granted.

15—3—38. Mr. M. D. Pitchai Pillai, on special duty in Kollegal Division, to Bhavani Range. 2. On relief by No. 1, Mr. S. Venkatarama Ayyar, Bhavani Range, Coimbatore North Division for special duty under the District Forest Officer Kollegal.

Ootacamund Circle.

24—11—37. Mr. K. P. Chathu Nair, to Begur Range. 2. Mr. C. P. Bimayya on relief will be Assistant Ranger, Begur. 3. On the expiry of his leave on 16th January 1938, Mr. J. S. Rowland, to Chedleth Range in relief of Mr. H. E. Brown, Extra Assistant Conservator, who has applied for leave.

15—12—37. Mr. K. A. Muddayya, as Assistant Range Officer, Nilambur Division, *vice* officiating Ranger K. M. Achayya granted leave. 2. Mr. K. M. Achavya, on expiry of his leave to Wynaad Division as Assistant Ranger. 3. Mr. B. M. Coates, on return from leave to Sigur Range, the Nilgiris Division, in relief of Acting Ranger Sankara Menon. 4. Mr. K. Dooma Shetty, on return from leave Mangalore Range, in relief of Ranger Md. Akbar. 5. Mr M. Rama Rao Kini, on return from leave to Mannarghat Range, Palghat Division, in relief of Acting Ranger C. J. Muthanna.

23—12—37. Mr. M. N. Mandanna, on return from leave to Kannoth Range, Wynaad Division. 2. On relief by No. 1, Mr. D'Souza, Temporary Ranger, will continue in the Wynaad Division for the present.

22—1—38. Mr. A. K. Nair, Range Officer, Amarampalam Senior Instructor, Vernacular Training School, *vice* Mr. Eswara Ayyar, 2. Mr. N. S. Eswara Ayyar, to Amarampalam Range, *vice* the above.

28—2—38. In continuation of the leave already granted Mr. K. Karunakaran Nambiar, extension of leave for two months from 23rd February 1938.

———

NOTICE.

Indian Forester Prize—1938.

Essay for the past and present students of the College.

—(o)—

Although every endeavour has been made in the past to set subjects for essays which will appeal to both and present students respectively, the number of entries has been disappointingly small in recent years, and the element of competition has been nearly absent.

Accordingly only one subject, common for both past and present students, is set for 1938 viz.,

"*Plant Succession in the forests of India (or Ceylon)*".

The essay should deal mainly with observations made in forests which are known to the essayist himself.

If there are sufficient entries to warrant it, the prize will be awarded as follows:—

1st Prize Rs. 30 in cash; 2nd Prize Rs. 20 in cash.

No award will be made unless a satisfactory standard is reached. The essay should be clearly written or typed on one side of the paper only and should not exceed 2000 words. It should be submitted to reach the Principal, Madras Forest College, not later than 1st June 1938. Any not received by this date will not be considered. The essay should be the unaided work of the competitor.

(Sd) J. H. Longrigg.
Principal.

Balance Sheet of M. F. C. Magazine for the year 1936—37 (1—7—36 to 30—6—37) :—

RECEIPTS.

	Particulars.	Rs.	As.	Ps.	Actual receipts. Rs.	As.	Gross receipts. Rs.	As.
I	Opening balance:							
(a)	Advance subscription-fund Rs. 66-10-0							
(b)	General fund 205-11-7							
		272	5	7				
II	Annual subscriptions released for '36–'37 from advance subcription fund ...						30	0
III	Subscriptions:							
(a)	Arrear subscriptions realised ...	7	8	0			7	8
(b)	Current year's subscription from:							
	25 gazetted officers @ 2–8–0 ...	62	8	0			62	8
	112 nongazetted officers @ 2–4–0...	252	0	0			252	0
(c)	Advance subscription for 1937–38 ...	6	12	0				
	Advance subscription '38–39 ...	2	4	0				
					331	0		
	V. P. P. registration fee recovered ...	12	15	0	12	15	12	15
V	Advertisements.	34	12	0	34	12	34	12
VI	Interest acrued on bank deposit ...	3	5	0	3	5	3	5
	Total ...	654	5	7	382	0	403	0

S. R. Umbarge.
(Student member)

G. Visvanatham,
(Editor & Treasurer)

EXPENDITURE.

	Particulars.	Rs.	As.	Ps.	Rs.	As.	Ps.
I	Paper & printing charges for 4 Nos. ...	289	14	0			
II	Stationery & Sundries ...	5	3	0			
III	Postage ...	69	15	0			
IV	Prize amount ...	25	0	0			
					390	0	0
	Closing balance:						
	Bank balance on 30-6-37	228	4	1			
	Cash balance on hand on 30–6–37 ...	36	1	6	264	5	7
	Total ...				654	5	7

Receipts	403—0—0
Expenditure	390—0—0
Surplus.	13—0—0

Closing balance:

Gross balance	264—5—7
Advance subscription fund as on 30–6–37	45–10—0
Nett closing balance	218–11—7

V. I. Seshagiri Rao.
(Business Supt.)