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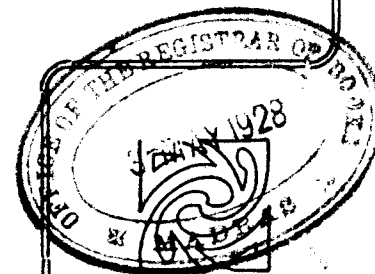
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Forest College Magazine.



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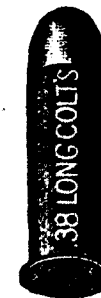
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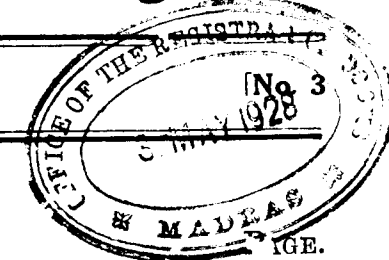
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Madras Forest College Magazine

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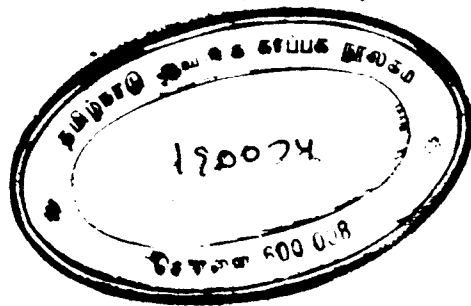
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Notice.

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Subscribers are requested to send in to the Editor, before 1st June 1928, their votes for what they judge to be the best of the eleven articles detailed overleaf. The articles appeared in Volume XI, 1926-27, of the Magazine, and the winner gets a prize of Rs. 30.

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[The winner for the year 1925-26 was Mr. Hukum Singh, Bsc.]

The Madras forest College Magazine.

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[No. 3.

Variations between the actual girth measurements with tapes and the girths obtained by the product of $\bar{\pi}$ and average diameter in the case of normal Sal trees.

VALUE OF $\bar{\pi} = 3.1416$.

The idea of writing this short note has originated from the check of Sal markings in a small area where all the fit trees were measured with diameter callipers, marked into inches and 2/10ths of an inch. The average diameter was obtained by taking $\frac{1}{2}$ of the sum of two diameters, measured at right angles to each other. The trees thus measured were serially numbered and in the field book the average diameter was recorded against the serial number to which it belonged. The check was carried out by actual girth measurements with tapes. By comparing the actual girths with the girths obtained by $\bar{\pi} \times$ average diameter, the following analysis of the variations was obtained:

Variations.	81		Total.
	No. of cases.		
	+	—	
0"—1"	3	4	7
1"—3"	3	13	16
3"—6"	7	21	28
6"—9"	4	6	10
9"—12"	3	2	5
12"—15"	1	6	7
15"—18"	6	2	8
18"—21"	1	5	6
21"—24"	0	1	1
24"—27"	1	1	2
27"—30"	0	1	1
30"—33"	1	0	1
33"—36"	1	1	2
42"—45"	0	1	1
Total	31	64	95

In 14 cases the measurements agreed all right.

NOTE :— In the above statement as well as in the one given below + signifies that the product of $\pi \times$ average diameter is greater than the actual girth measurement, while—signifies that the latter is greater than the former.

The girth check in the above cases was unfortunately carried out by a Forest guard whose measurements could not subsequently be checked, as fellings had immediately afterwards taken place in the area. It is therefore possible that he might have included some abnormal trees in his girth check. There is also a strong probability of the introduction of personal errors in the girth measurements owing to faulty measurements of a man of his position and education. It is now impossible to eliminate these errors.

When these variations were placed before some Forest officers they expressed the following opinions about them :—

(1) Of the 109 trees checked only 14 are correct. 64 are actually larger than marking officer's measurements and 31 are smaller. Of these 95 trees the actual girth measurements in 29 cases are over 1' different from those recorded, of which 7 being over 2' different. The fact that callipers were used for markings and re-check was made with a tape does not suffice to explain the differences found.

(2) Out of 109 trees checked only 14 are correct. The difference in the case of the rest range from 1" to 3'6". Some of the differences are such that they can not be satisfied by saying that the measurements were made with callipers and the re-check was made with a tape.

(3) Out of 109 trees checked only 14 are correct and the rest incorrect. If the differences were due to wrong callipers there ought to have been the same difference in all cases.

- (4) (a) Trees found correct, 14
- (b) Trees varying by 1" may be taken as correct owing to the fact that one set is in diameters and had to be converted into girths, 7
- (c) Trees varying by 6" and under, may be taken as sufficiently correct. This error would be possible with a poor pair of callipers and allowing for the fact that measurements may not have been taken at the same point and also to variations in the shape of the stem. Again the conversion to girth classes has to be considered, 44.
- (d) Trees varying by more than 6" but less than 12" can be attributed to very careless inspection of his callipers by the marking officer, 15.
- (e) Trees varying by more than 12" can not be reconciled, 29. In all these opinions if there is anything clear enough it is the tacit assumption made that the product of π and average diameter is always equal to the actual girth of a tree as measured by a tape.

An examination of a large number of cases proves this assumption to be wrong. The few cases of agreement are to be treated rather as accidental coincidences and not as a general rule. The cross-sections of trees are, in the majority of cases, far from being perfectly

circular and even in the few cases in which they are so the product by the above formula can not always be equal to the actual girth measurement as the value of π is indeterminate and there will always be found some difference.

As a general rule it may be stated that the cross-section of trees assume various circular shapes in nature and it is impossible to reduce them to a single type such as circle or ellipse. In all cases therefore :

Actual girth measurement = $\pi \times$ average diameter + variation due to deviation of the cross-section from the circular shape + variation due to indeterminate value of π .

With the object of ascertaining the extent of variations in individual cases the writer measured with diameter callipers and tape, 200 Sal trees which were all normal. These trees were not selected at random for measurements but all trees in the crop, with the exception of abnormal ones, were measured. At his request four of his friends also, serving in different parts of U. P., measured 100 trees each. The measurements were as before, confined to normal trees alone. On comparison of the results of these measurements there was not only strong corroboration of the variations found by the writer but in many cases it was also found that the actual girths varied from 3" to 14" although the average diameter remained the same in all cases. The analyses of these five sets of measurements are shown in the following statement.

VARIATIONS.	DIAMETER							
	inches.		inches.		inches.		inches.	
	8—12		12—16		16—20		20—24	
	No. of cases.		No. of cases.		No. of cases.		No. of cases.	
	+	—	+	—	+	—	+	—
0 inches—1 inches.	1	10	11	48	12	84	10	27
1 „ —3 „	1	15	5	91	14	75	9	44
3 „ —6 „	0	1	0	31	1	14	5	18
6 „ —9 „	0	0	1	1	24	7	3	4
9 „ —12 „	0	0	1	0	0	1	2	1
12 „ —15 „	0	0	0	1	0	1	0	4
15 „ —18 „	0	0	0	1	0	1	1	0
18 „ —21 „	0	0	0	1	0	5	0	0
21 „ —24 „	0	0	0	0	0	1	0	0
24 „ —27 „	0	0	0	0	0	0	0	1
27 „ —30 „	0	0	0	0	0	1	0	0
30 „ —33 „	0	0	0	0	0	0	0	0
33 „ —36 „	0	0	0	0	0	0	0	0
Nil.		0		0		6		2

CLASSES.

inches.		inches.		inches.		inches.		Total.	
24—28		28—32		32—36		36—39			
No. of cases.		No. of cases.		No. of cases.		No. of cases.		No. of cases.	
+	—	+	—	+	—	+	—	+	—
6	10	8	2	0	1	0	0	48	132
3	16	3	6	0	0	0	0	35	247
3	12	1	3	2	0	0	0	12	79
2	0	3	1	0	0	0	0	33	13
1	0	1	0	1	0	0	0	6	2
3	1	0	0	0	0	0	0	3	8
2	1	3	0	0	0	0	0	6	3
0	0	0	0	0	1	0	0	0	6
0	0	0	0	0	1	0	0	0	2
1	0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	0	0	1	0
0	0	0	0	0	1	0	1	0	2
	0		1		0		0		9

Total No. of sal trees measured = 650.

NOTE :—In the above statement the number of cases in which the variations occur are shown under the various diameter classes in which they occur. The rest of the statement explains itself.

In fact so far as the writer is concerned he is clear that, however accurately the diameters are measured, variations of the kind shown above do always occur and it is impossible to strive to ignore their very existence.

Assuming then that variations as shown above do always occur and that behind every particular manifestation in nature there is a generalisation and further that between the extreme limits of variations nature must have realised numerous intermediaries to fill up the gaps, the writer believes that it is possible to graphically represent these variations for each 4 inches diameter class. This can only be possible if the extreme limit of variation for each diameter class is known. With a large set of measurements taken in all kinds of localities, different elevational ranges, different aspects, etc., it may be possible to ascertain this maximum limit. The writer therefore, requests the readers of the *Indian Forester and Madras Forest College Magazine*, to take up the investigation and throw light on this subject through the columns of these journals. The subject is, no doubt, not of much practical importance but the fact that very vague ideas about it are in existence amongst us is a sufficient reason in itself to justify the taking up of the investigation.

UMADATT ASWAL,
Forest Ranger,
Naini Tal Forest Division.

Wild cows in Guntur District.

Before coming to the essay on wild cows, it is essential to give a brief description of the forests, which they infest, viz., the jungle, and the Mangrove forests of Muthayapalem and Nizampatnam reserves of Repalli Range. Muthayapalem reserve is almost a jungle reserve on pure sandy soil, with impenetrable prickly pear, covering the ground all over, except on 'parras' (bare pieces of land with no vegetation), commencing from Gavinivaripalem right up to Perli, a distance of about 10 miles with the Bay of Bengal as its eastern boundary. The mangrove forests occupy a little portion of this reserve between the Bay of Bengal and the jungle reserve from Surayalanka Pogar (opening of the sea into land) to Ponnal Kalva, a distance of 5 miles nearly.

The Naizampatnam Mangrove reserve forest commences in continuation of the Muthayapalem reserve with a few jungle reserves interspersed in it, and extend up to Alchi canal, a distance of about 10 miles.

About 20 villages surround these forests on 2 sides. It has become a common practice of these villagers, to allow their cattle to go astray, (and this turned to half nature in them), as the crops which these people raise are generally ground-nut, ragi and paddy most of them on a small scale which will not yield an adequate supply of fodder to all cattle but only just sufficient to meet the demands of plough bulls and milch buffaloes.

These cattle (mostly cows) having been separated from human touch resorted to the reserved forests is adjoining the villages. Throughout the day time they walk in the jungle reserves amidst the prickly pear and after sunset come out to find a refuge, from the mosquito bite. They gather in hundreds on parras in reserve forests irrespective of age and sex during nights and get back after dawn. If they once enter the jungle reserve any amount of effort to pursue them will be of no avail.

The cows of Perli (a village) that hide in the jungle reserve in the day time come out and enter the adjoining mangrove coupes and take rest on some suitable hard soil after satisfying the demand of their stomach.

In the rainy season when the parras get swampy, they spend the nights on the sea shore. Some cows in Nizampatnam reserve stop in the mangrove forests during days and nights, and during rainy season when floods from uplands rush on this area, the cows confine themselves to an elevated place and till flood level goes down remain there starving for days. The wild cows that take refuge in jungle reserve live entirely on young prickly pear in summer season when no fresh water is available either in Reserved Forests or its surroundings. In the time of severe drought several cows die and their skeletons near dried up ponds prove this fact. Some depressed class persons entrap these wild cows and kill them with the object of getting the hide and the beef.

After having known something about the wild cows one will be anxious to know the actual enjoyment of the owners who claim the right

over these. Every owner who possesses some cows (wild) exactly knows the place where they take shelter and when he comes to know that any cow of his will deliver a calf in a week or fortnight he will be closely watching the movements of the animal and when he finds a new born calf along with the mother secures the help of some people and catches and takes the calf home, when the cow though wild follows them and surrenders for the sake of the young one. If the calf happens to be a he-calf the owner allows full milk to the calf with a view to utilize it for ploughing purposes when grown; when the cow runs dry it returns to the forest leaving the he-calf to the care of the owner who will not allow it freedom. If on the other hand the calf happens to be a she-calf, the owner enjoys half the milk or even more and when he could extract no more milk he leaves the mother and the calf with a permanent mark affixed on them claiming his right. Some calves which were lost sight of by the owners have become too wild and they are not to be seen easily except on sea shore during nights in rainy season. If they get the scent of man they run away like frightened steeds and if on the other hand they are driven to bay they challenge for a combat. The wild bulls are very nice to look at with a fine hump and pointed straight horns. Among wild cows they are pure wild and semi-wild cows which can be distinguished from their foot prints. The foot print of a pure wild cow is pointed and conical in shape, while that of a semi wild cow is less pointed; both these are entirely different from the familiar foot-print of our domestic cow.

The word semi-wild is used to indicate those cows which near a village for drinking water. Pure wild cows seldom approach the boundary even & these are claimed by some one if caught.

If any villager wants to dispose of his cattle in the forest he sells them at a very cheap rate about Rs. 10 a cow on average by showing his animals in the forest to the purchaser who receives them by a simple look at them & the marks, and this kind of transaction exists in these forest villages.

Having known something about wild cows & their owners we now come to forest matters in these localities.

Coupes are being worked in Muthayapalam & Nizampatnam Reserved forests both in jungle and mangrove areas under a working plan. The maximum amount realised on coupes in Mangrove forests was Rs. 90 per acre in 1925. The mangrove forests with the exception of a few species do not coppice, and a pure natural regeneration forest is obtained after an area of forest is clear felled, the seeds being brought and deposited by the flow and ebb tides which come and go twice in a day. In Muthayapalayam jungle reserve, coupes are being worked under simple coppice system. The wild cows are attracted by the grass and coppice shoots within their reach and completely eat away the coppice shoots of trees they like best, and the result of future working may be inferred.

In mangrove coupes the important seedlings (**Mada*) appear after the end of 1st year at a foot height from the ground and as 'mada' leaves are among the best liked by cattle, the cows mercilessly crop the seedlings and in the course of their going about trample over thousands of seedlings, which never come up being buried in silt, the very site of which will be sickening to look at by any forest officer who knows

their importance. Thus the promising regeneration in mangrove coupes is denied. This can be evidenced from the growth in coupes 1 to 14 of Muthayapalam mangrove area by the side of jungle reserve felled from 1913 to 1923. The growth is no better than the coupes worked from 1924 to 1926 which are towards sea shore and which coupes the wild cows do not frequent.

In the forest villages, it is not possible to secure the co-operation of the villagers to catch these wild cows as every one who possesses cows in R. land will flatly refuse to follow the forest officers. There is only one village Gokarnamatam, where the Village Munsiff on several occasions rendered immediate help. His own kinsmen about 20 in number were sent on each occasion though the village munsiff was threatened with murder by the villagers whose semi-wild cows were impounded. Such men like these are not encouraged at least through rewards. It is unweildy for the few forest subordinates in charge of these forests to put down illegal grazing in areas closed to grazing. Experience dictates that if 20 or 30 persons encircle a group of cows 200 or 400, before day break and begin to drive these to any near village to be impounded, only 10 to 20 reach the pound and some times the result will be a disappointment. The mangrove forests are subject to ebb and flow of salt water and the whole area is alluvial though deep, several creeks running like the veins in a leaf and the difficulty to collect these cows can be understood and in the jungle area the same is the result owing to the presence of unweildy prickly pear and impenetrable thorny shrubs.

The owners having fully understood the talents of their cattle make a few spasmodic efforts to purchase grazing permits just to cover 10 % of the cows and keep permits safe at home though most of them knew the rules laid down on the reverse of the permit. In October 1926 the District Forest officer, Guntur, organized a party consisting of 3 Range officers, 5 foresters and 35 Forest Guards and watchers and conducted raids in Muthayapalam and Nizampatnam reserves on receipt of a report from the working plan officer who made mention of the havoc that was being done by wild cows. The District Forest officer could not get orders to shoot these wild cows. I happened to be one of those foresters from upland ranges and was given a party of 10 subordinates with instructions to go one side and seize the cows. It was the first occasion for me to see prickly pear jungle reserve and mangrove forests. I succeeded in seizing about 50 cows at 5 a. m., lying on a parra, close to the Bay of Bengal under two favourable conditions, the first being that I was able to catch a person (perhaps the owner of some cows) who reached the place at that hour to scatter them away, and having tackled him with tact drove the animals with all possible care to the newly dug Nallamada drain which passes through the jungle reserve. The other parties collected about 30 cows and met me at 8 p. m. in the same place arranged previously. We successfully drove 80 cows to the pound though some escaped through the drain with hillock like sand banks on both sides. On 2 days we had entire disappointment though we came across 500 to 800 cows every day. One day we were able to catch 2 pure wild cows. The moment they were caught by ropes, they dropped down and did not get up though

several of us tried to make them stand. They were taken to Bapatla pound by 12 noon by rather barbarous means and when they were given fodder they declined to eat, as their freedom was arrested and as they were seeing the human faces. After 4 or 5 days some one released these two cows having had a faint remembrance of the identification of them. The owners of these cows who purchased permits and safely preserved them at home came down in groups to Bapatla and a deputation of ryots approached the District Forest Officer requesting him to see their permits and excuse them. The permit numbers were noted and cases were prepared against the owners (released) and launched for trial in the Magistrate's courts at Bapatla and Rapalli under sec. 21 Act V of 1882 of the M. F. A.

Y. S. NAIDU,
M. F. C. 1927-29. Dn.

Sample Plots.

1. The theory of a sample plot is very simple. To find the volume of timber standing on a large area you measure up as accurately as possible the volume standing on a small area, and then multiply that volume by the relation the large area bears to the small. The small area is your sample plot. In practice, however, many difficulties appear. Let us, for the sake of simplicity, take the case of a large even aged wood. Before you even see the wood, from your own experience you would expect the slope, soil and moisture content of the soil to vary. An examination of the wood will confirm this and you will find that as each of these factors varies so do the trees. In other words, the wood will be of different qualities. Aspect, an important factor in some countries, does not effect us much here in Madras. The quality of a crop is generally judged by the height growth.

2. A sample plot must be a fair sample of the wood. This does not mean that it must contain growth intermediate between the best and the poorest qualities. To find the volume of timber in the wood we are considering by means of a single sample plot would not be practicable. The choice of the sample plot would be so difficult that only by the merest chance would it be a fair sample of the whole wood. The only thing to do is to map the quality classes in the wood, and lay out a sample plot in each quality class. Here again the plot must be a fair sample of its quality class in stocking as well as in growth. If the whole wood is fully stocked, there is little difficulty. But such a state of affairs is rare. Our way out of the difficulty is to choose your plot in a fully stocked area when the growth is average for its quality,

divide the area of the quality class into compartments or sub-compartments, and note the density of stocking (an eye estimate) of each of them. It is usual to estimate stocking by decimal points, counting a fully stocked (but not over-stocked) area as 1.0.

3. The measurement of sample plots by the standard Dehra Dun method has probably been described to you. Briefly it consists of the following:—

(a) The area of the plot must be accurately known, and the plot must be fully stocked,

(b) The minimum timber limit (stem or branch) is 8 inches diameter over bark, everything from that limit down to 2 inches diameter over bark counting as small wood. Everything else is ignored except in measuring the total height, which is taken to the topmost twig.

(c) Two breast height diameters of each tree in the standing crops and in the thinnings are measured.

(d) The sample trees chosen represent the full range of diameters in the standing crop.

(e) Each sample tree is measured up accurately to find the total height, volume of timber under bark, volume of small wood over bark, form factor, etc. All volumes are solid volumes.

4. The actual measuring, once you have done it a few times, is routine work; but until you know it by heart you will be well advised to take with you the full instructions given you in lectures.

Otherwise, after you have submitted your measurements to the proper authorities, you will find they will possibly be returned to you for explaining why in a certain sample tree which you have shown to contain no timber the diameters of the first smallwood section are over 8 inches; or why in another sample tree the mid-diameter taken over bark at 31 feet is smaller than the diameter of a certain smallwood section taken at 35 feet. There are a few other traps for the unwary.

5. The choice of sample trees is a matter for judgement, and is often of some difficulty. It will make the matter clearer if we discuss first the manner of working out results. This is done at Dehra Dun. The volumes of timber and smallwood in each sample tree are first calculated from your measurements, and so is the basal area (area of cross-section at breast height). The volume of a tree is the basal area $\times$ total height $\times$ form factor. The only unknown quantity being the form factor, this can easily be found for each sample tree. From the data thus obtained from each sample tree two graphs are plotted, (a) total height over diameter, and (a) form factor over diameter, and a fair curve drawn through each. The standing crop in your plot is then divided into groups. The only rules about these groups are firstly that trees containing timber are separated from those containing small wood only, and secondly the total basal area of each group must not exceed 50 sq. feet. These basal areas are, of course, found from your diameter measurements (para 3 c). The basal area and diameter of the theoretical mean sample tree of each group are then calculated. The total height and form factor of this mean sample tree are read off from the curves and the volume calculated. The volume of the whole group is the

volume of the mean sample tree multiplied by the number of trees in the group.

6. As you see, the whole method depends on the accuracy of the curves, which are formed from your sample trees. It is therefore of the utmost importance to use good judgement in selecting sample trees. A sample tree must be a fair sample of its diameter class both in height and in shape. If it is too short or too tall, too branchy or has too small a crown, it will be a bad sample tree. Remember too that it is to be a sample of the crop left standing. Take a good look at several trees of that diameter in the plot to get a fair idea of their height and shape. Then see if you can get a good sample tree from among the trees marked for thinning. If you cannot, look round outside the plot, but remember not to go into a different quality class by mistake. If you are not certain about the height, use a clinometer.

7. The number of sample trees required depends on the area of your plot, and the number of trees in it. Usually about 15 are enough. The greater number should be in those diameter classes which obviously contain most of the volume of the plot. This is to ensure the curves being especially accurate there. Choose your sample trees always bearing the curves in mind. Select sample trees for the smallest and biggest diameters measured, to show the beginning and end of the curve, and scatter the remainder through the diameter classes not already represented.

8. The following instance will make the spacing of sample trees clear.

Diams.	Number of Diams Measured in main Crop.	Number of Sample Trees Chosen.
5 "	1	1
6 "	5	1
7 "	12	1
8 "	27	2
9 "	40	4
10 "	35	4
11 "	10	1
12 "	2	1
	<u>132</u> diams = 61 trees	<u>15</u>

The 9" and 10" classes obviously contain the greater part of the volume of the plot. The 6", 7" and 8" classes have 44 diameters, but these are small trees. The 11" and 12" classes are big trees, but there are only a few of them.

9. As a matter of fact in working out results each diameter is taken as representing one tree, so the number of trees is doubled and so is the area of the plot.

10. The area of the plot will depend on circumstances. The main deciding factors are that the plot must be fully stocked and the quality of the crops in the plot must not vary. If you can get an acre, all well and good, but you will often find it difficult to get half that.

11. One measurement of a sample plot will give its volume. Single measurements at about the same time of different plots in different age classes will give a vague idea of the volume increment. But to find the increment accurately the same plot must be measured at

intervals. If a plot is first measured in the year 0, subsequent measurements will be made in the years 5, 10, 20, 30, 40 and 80 on. These are permanent sample plots, and, when properly done, their measurements give you everything you want to know about woods of that species and quality.

12. The real test of sample plot volume measurements comes at the end of the rotation. The plot is then clear felled and each tree is measured up completely as though it was a sample tree. The volume of the plot is then the sum of the volumes of all the trees.

J. D. CONOLLY,
Forest Research Officer.

ATHLETICS.

The following Vice Captains of games are appointed :—

Cricket.	ASTEWALLA.	(Bombay.)
Hockey.	SITARAM SINGH.	(C. P.)
Football.	BARKATT ALI.	(Do.)

The following students are awarded their colours :—

CRICKET.		HOCKEY.	
A. RAGHAVIAH.	(Private.)	D. P. KETKAR.	(C. P.)
SOHAN SINGH.	(Bombay.)	SOHAN SINGH.	(Bombay.)
G. B. GANGOLLY.	(Do.)	WALI MOHAMMAD.	(C. P.)
D. P. KETKAR.	(C. P.)	A. RAGHAVIAH.	(Private.)
B. SHAFFI.	(Hyderabad.)	HOHAMMAD AHMAD KHAN.	(C.P.)

The following students have obtained the required number of points in Athletic Sports :—

A. RAGHAVIAH.	(Private.)
G. B. GANGOLLY.	(Bombay.)
WALI MOHAMMAD.	(C. P.)
SITARAM SINGH.	(C P.)

EXTRACTS.

1. **Cleveland moves large trees:** That large trees can be successfully moved and transported was recently demonstrated in Cleveland, Ohio, when the Division of Forestry of the City Department of Parks, and Public property moved a number of 19 inch elm trees from the outskirts of the city and transplanted them at the site of the new Art Museum in the heart of the City. The success of the enterprise was due chiefly to the improved Irish tree movers recently acquired by the city. These machines weigh more than 3000 lbs. and consist chiefly of a large curved cupped cradle with which the tree and ball of soil around the roots is lifted and transported. One of the outstanding features of the new machine is the great lifting force directly at the point of most resistance, the under side of the ball of soil and roots. This prevents serious injury to the roots and trunk of the tree. The movers have a capacity of eight times their weight.

American Forests & Forest Life, Nov. 1927.

2. **Two varieties in Blue-gum:** There are two well-defined varieties of *Eucalyptus globulus*, in Australia. A form with small buds and capsules, and scaly whitish tightly clinging outer bark is found widely distributed on lower slopes of hills throughout Victoria and Southern New South Wales.

The second form has larger buds and seed capsules, and rougher greenish grey bark which is shed in long vertical strips. This is rarely found in pure stands either in Victoria or Tasmania.

American Forests & Forest life Nov. 1927,

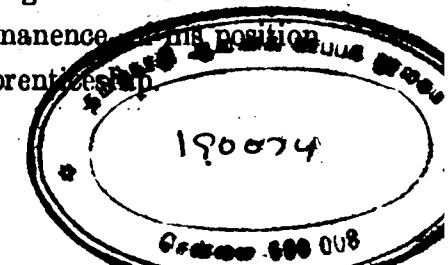
3. **Forester's essential qualities:** "As to the essential qualities that make for success in a would-be forester" said Dean Howe, "I am fairly confident that it can be said of the forester, as of the poet, that he 'is born, not made.' He should possess robust health & good eyesight. But, given these, there are five qualities that I regard as essential.

In the first place, a man if he would succeed as a forester must have a real affection for out-door life. That is either born in a man or it is not, and if it is not born in him, he cannot be educated into acquiring it.

Secondly, he must be possessed of the capacity for living his daily life without contact with congenial companions. This is not a common quality, but it is an indispensable one in a forester.

Thirdly, he must have the sort of feeling in his work that he is serving an apprenticeship, and that the permanence of his position depends on the way in which he serves that apprenticeship.

36
J.B., d, m 211, N16
N 28



Fourthly he needs tact, discretion and judgment in his contacts with other men, particularly the practical woodsman.

Fifthly, — and most important of all he must be thorough and honest in his day's work.

4. **Cork:** Cork is the outer layer of the bark of an ever green Oak (*Quercus suber*). Its commercial production is restricted to a comparatively small area bordering the western Mediterranean Sea. Portugal probably produces more cork than any other country, but Spain is regarded as the Centre of the Cork industry, because it imports large quantities from Portugal and re-exports it together with Spanish product in the various manufactured forms.

The thickness of the bark varies from $\frac{1}{2}$ to $2\frac{1}{2}$ in, each tree yielding from 45 to 500 lb of cork. The trees are very slow growing, and generally do not attain a size suitable for stripping until about twenty to thirty years of age or more. The best cork is produced from the drier and more rocky soils. Young trees, generally speaking, produce the best quality of cork, although the first stripping, called "virgin" cork, is of very inferior grade, and is used only for granulated cork. The first stripping does not injure the growth; on the other hand, it seems to stimulate further development of both the bark and wood growth. The most valuable cork is generally about an inch in thickness and this is produced from rather young, vigorous trees, about forty to fifty years of age, and from the lower branches of the older trees. Great care is taken by the strippers not to injure the inner bark at any point. The cambium layer turns a rich dark red shortly after stripping and remains in this condition until the next year's growth.

In the manufacturing process, the raw bark after drying is boiled in large copper vats for about three quarters of an hour, in order to soften it & increase its volume & elasticity, & to remove the tannic acid.

Cork is utilised in various ways. Its low specific gravity combined with its strength toughness & durability, cause it to be in great demand for life-belts, buoys, floats, and for several special devices for the prevention of drowning. Its impervious and compressive qualities bring it into wide use for bottle stoppers. Its lightness softness & low conductivity of heat render it an excellent lining for hats and soles of shoes. Its use for insulation in refrigeration has developed very broadly in the past twenty years. Other common uses are table mats for hot dishes, pin-cushions, lining entomological boxes, bath mats washers, panholder tips, carburetor floats, churnlids, cork balls, gaskets, instrument and fishing rod handles etc. Recently it has come into greater use for cigarette tips and cork paper from $\frac{1}{16}$ to $\frac{1}{32}$ of an inch in thickness.

— *Forest Products, their manufacture and use* — By Nelson Courtland Brown, B. A., M. F.

5. **Steel railroad ties, vs. Wood :—**

Are steel railroad ties as a substitute for wood a success? Apparently not. A recent syndicate article by Dr. Frank Crane on "Substitutes for wood" drew fire and brought out the fact that at least one steel company in the United States has abandoned the use of steel

ties on its own rail-road; that steel ties have been discarded in England, and that one large municipal railway in this country has resumed the use of wooden ties after years of using steel. The reason lies in the fact that wood has the greater resilience and that when treated with a good preservative the better species last longer than steel.

6. Ply-Wood: Where and when it originated :—

Ply-wood is a term used to designate built-up wood, made by glueing together thin sheets or plies, so that the grain of each ply is placed at right angles to that of the next. The art of veneering—or making ply-wood—probably originated in Egypt more than thirty five centuries ago. Specimens of veneered furniture taken from the tomb of Rameses, Tutankhamen and other Pharaohs attest to the skill of these early craftsmen.

7. Why Antelope decrease :—

Writing on "Backtrails of the Old West" Richard B. Kilroy tells why it is so difficult to preserve the antelope.

The antelope like the buffalo has also scorned to seek asylum in the friendly shelter of the forest, depending entirely upon his fleet foot to elude the hunter. The deer, particularly the white tail variety, is on the other hand, a habitant of the foot-hills and rarely wanders far from cover, for which he breaks at the very first sight, sound, or smell of alarm. The mule deer of the West, a larger and rarer species, is like the antelope, more at home in the open or park country on the edge of the forests, and perhaps it is due to this choice that his tribe shows no tendency to increase.

The antelope, like the buffalo, were also unwise enough to be gregarious. The large herds in which they gathered at certain seasons were more easily decimated than the deer who ran in couples or small bands. The antelope's consuming curiosity also contributed to his doom. He couldn't resist the impulse to make a close investigation of any strange subject that excited his attention; so that hunters often carried a red cloth or handkerchief, which tied near the muzzle of the gun and waved from ambush, drew the inquisitive quarry within range.

Vanity, faith in his speed, good-fellowship and curiosity; these were the ingredients of his fate, the cumulative and contributory causes of his premature passing.

8. Water submersion prevents insect injury :—

".....it has been found that if hickory, oak and ashwood are submerged in water before being milled, insect injury is greatly reduced. This advice has been followed with exceptional results by a firm in Virginia. Damage to their green and seasoned stock had formerly ranged from 15 to 90 % but after three years' trial of the recommended practices it is now only 1 or 2 %."

(5 to 8)—*Extracts from "American Forests and Forest life"—Feb. '28.*

9. The largest single span bridge of reinforced concrete in India :—

The Kuthopozha Bridge on the Tellicherry Mercara road which was opened to traffic on the 18th March 1928, is a single span constructed entirely of reinforced concrete, & has replaced an old masonry bridge which was washed away in the disastrous floods of

1924. The span of the new bridge, which is capable of carrying a total load of 60 tons, is 120 feet clear, & is understood to be the largest single span bridge of reinforced concrete yet constructed in India. The General Construction Co., Ltd., of Pantheon road, Madras, were responsible both for the design & construction.

"The Madras Mail" 25-3-28.

10. The wood-pecker:—

When sleepy time comes to the wood-pecker, he hunts for a tree with a rough bark, so that he can have a good toe hold. Clinging to the tree with his toes, and using his stiff tail for a brace, he tucks his red head under his wing, and goes to sleep in the greatest of comfort. Chimney swifts sleep in much the same way, using the side of a wall for a bed.

11. Strengthening wood-pulp:—

A German chemist has discovered that the great strength of sulphate pulp paper made from resin-bearing woods is due to fats and fatty acids which form a binder under the action of air, knitting the fibres together like felt. It is proposed to add strength to other kinds of pulp by adding extracts from resin-bearing trees.

12. Petrified forest:—

A remarkable petrified forest is reported discovered in the Big Bend region of Texas. It is said that trunks stand upright to the height of a hundred and fifty feet.

13. The world's largest one-piece table is thought to be that used for community dinners at Glen Grayland, Washington. Having been made from a section of spruce log which floated into the harbour, this table has a diameter of more than eleven feet and will easily seat thirty five persons.

—(10-13) "Forest and Outdoors"—Jan. 1928

14. A large daily newspaper in the United States requires the pulpwood on over 100 acres of spruce and balsam to publish one Sunday edition.

15. Synthetic wood:—

The day may come when junk dealers will be collecting sawdust, old boards, broken furniture etc. to be re-manufactured into a new lumber, according to scientists of the New York state College of Forestry. This material, it is stated, is being changed by newly discovered processes into boards, beams, mouldings and forms in which wood has never before been used. This synthetic wood bears a close resemblance to paste board. Its texture is much finer than wood, and for many purposes, especially interior construction it is said to be more serviceable than the natural product. A product made from hard wood waste is now being used in automobile bodies.

— Forest & Out-doors — Feb. 1928.

16. Botany and organic chemistry:—

"As an example of the value of collaboration between organic chemists & botanists, he (Dr. Simonsen) alluded to the two grasses

known as 'Sofia' and 'Motia'; although these are both classified as *Cymbopogon Martini*, Staf, the first yields the valuable palmarosa oil, while the second gives a comparatively valueless ginger-grass oil. He suggested that a detailed botanical and chemical examination of the many Indian *Cymbopogon* grasses would probably lead to results as interesting as those obtained by Baker & Smith in their work on the differentiation of closely allied species of *Eucalyptus* and that such work might throw light on possible relationships between the chemical constituents of a specific oil and characteristics of soil and climate.

'Nature' 11th Feb. 1928.

17. Beetles injurious to timber:—

A useful pamphlet devoted to this subject has recently been issued by the Forestry Commission, London, by Dr. J. W. Munro. Certain Longicorn beetles and pin-hole borers are essentially forest insects, since they attack timber just after it has been felled, abandoning it after it has become dried and seasoned. The powder-post, and furniture beetles, on the other hand, attack seasoned timber, the former occurring in timber yards, and the latter infesting old furniture, rafters of ancient buildings etc. A good and well-illustrated account of these several kinds of beetles is given and the types of damage sustained clearly explained, while suggestions are made regarding preventive and remedial measures. The losses occasioned by beetle attacks to the roofing timbers of Westminster Hall, and certain other public buildings are a matter of serious concern to those in charge of the preserva-

tion of ancient buildings. There is evidently a good deal of research still to be carried out before a speedy and trustworthy method of treatment can be devised. At present methods require to be periodically applied, even over several years, and no chemical preparation is known which will eradicate beetles from infested timber in a single application.

—'Nature'—11th Feb. 1928

18. The Heaviest and Hardest Wood in the World:—

GUAIACUM OFFICINALE, L. ("Lignum-vitae" of the trade.)

"Small or medium sized, thick boled tree, occurring on the W. Coast (of America). Leaves opposite; pinnate. Flowers: Blue or purple; fruit: an angled capsule. Wood: brown or olive, becoming dark green on exposure, fragrantly scented; has waxy appearance and feel, is exceedingly hard, and heavy, very fine textured; has interlocked grain; highly durable.

The heaviest and hardest wood in the world. Specific gravity 1.32. (Sp. gravity of Balsa wood, the lightest in the world is 0.12.)

Principal commercial use is for bearings of propeller shafts in steam ships.

—Yale University, School of Forestry "Tropical Woods" June 1927."

19. A short-cut by birds to the honey in the flowers of *Sesbania grandiflora*:—

Numerous examples are known to anthoecologists of "unbidden guests" These, as is well known steal from the flowers the store of honey meant for the use of pollinating insects. The result is that the

right kind of insects no more pay their visits, with the consequence that the fertilization of flowers is either prevented or its chances considerably decreased. The effect of this on the seed-producing capacity of the plant is considerable.

A remarkable instance of this is to be found in the flowers of *Sesbania grandiflora* (Papilionaceae). This plant begins to flower in Benares about the beginning of November and continues to do so almost till the end of January. This period happens also to correspond almost exactly with the time when feathered visitors migrate in large numbers to these parts from colder regions, and on closer observation it was found that it is largely these birds which are responsible for robbing the plant of its store of useful nectar, without doing any service in return.

In order to appreciate fully the intelligent way in which these birds carry on their business it is necessary to give a brief account of the morphology of the flower. When fully developed the flowers like those of almost all other Papilionatae bear a striking resemblance, to the pose of a bird in flight. The standard is clawed, and in fully opened flowers bends shortly forward in the form of a cowl over what looks like the bird's head. The latter is formed by the calyx tube surrounding the essential organs and serves for the storage of honey. In the bud condition the standard forms a sort of tight jacket round the other petals, and jointly with the calyx effectively guards all approaches to honey.

The honey is secreted by a number of glands situated on the inner side of the united bases of nine stamens around the ovary and

stored in a beautiful bowl-shaped cavity formed by them. The filament of the 10th free stamen fits nicely over a gutter like groove in front to prevent any drain of the fluid, and forms together with the base of the ovary a partition and is of such width that it just leaves two oval holes at the top, simulating the orbits in a human cranium, and apparently serving as approaches to the honey.

The interesting point in the stealing process is the fact that the robbers seem to have found out the exact position of the honey passages, and peck holes at the spot with great deliberation and precision. Out of the many flowers examined by the writer, only rarely specimens were met with which showed evidences of pecking wide of these points, and these probably represent attempts of foolish or inexperienced birds. Another interesting point, and one which brings the intelligence of these birds surprisingly into prominence is the fact that only those buds which have developed sufficiently to be able to secrete honey, are sought, the younger ones are apparently deliberately avoided, except in rare instances for which again inexperienced or stupid birds may be responsible.

Cases like these are of immense interest and open up many questions with regard to the intelligence of birds. How is it for instance that they get to know the particular stage of development at which the nectary begins to secrete honey? and again how is it that they came to locate exactly the positions of the honey passages in the unopened buds? Instinct and intuition may enable one to understand the habit of birds in approaching flowers but they scarcely suffice to explain the wonderfully exact nature of their behaviour in locating the

exact points where holes ought to be made and in selecting only those flower buds in which nectaries have begun to function.

The following birds have been noticed in the act of pecking flowers, in addition to squirrels which bite at and destroy flowers in large numbers. But the list is not claimed to be by any means exhaustive, and doubtless there must be other birds concerned:—

The common Parroquet; the Indian purple Sun-bird; the red-vented Bulbul.

In addition to these the common Myna and the house crow have also been seen sitting in large numbers on the plant, but the writer has not had any occasion to notice them in the actual act of pecking.

—N. K. TIWARY M. Sc.

(Extract from "Journal of Indian Botany" Vol. V No. 3 December 1926)

There are said to be 600 different uses for the bamboo cane. And yet we learned only one of them at school.

The uptodate excuse:—

Farmer:—Hey, there! 'Ow come you to be up my apple tree?

Boy:—Please, mister, I just fell off an aeroplane.

20. Manna: Food of the Desert:—

Until now it has been commonly held that the 'Manna' of Tamarisk was the manna of the Bible, but few knew anything about

the secretion of the substance from the tree. A Jewish university expedition has found that the manna was a secretion of small "Coccidae" insects, mealy bugs, and scale insects. These insects secrete from their bodies a very clear juice which fell in drops upon the ground. The quantity of these secretions depended very largely upon the elements, in other words, upon the nourishment obtained by the insects by the weather in the laying of their eggs. When there was a large quantity, the drops falling on the ground hardened and lay as white sugar grains.

21. Where to shoot an elephant:—

There are three shots and only three by which you may kill an elephant. You may pierce his brain pan through the frontal bone, but this needs the proper direction and the proper angle, a combination which is very seldom attainable. You may shoot him through the heart, but this organ is protected by a mass of flesh; the shot is not a broad-side one; and the angle has to be judged to a nicety. Moreover, reflex action may be delayed just long enough for the animal to damage you considerably.

Lastly there is the broad-side shot to the brain between eye and ear, neat, effective, and above all humane.

—*The Times of India Illustrated Weekly, April 15, 1928*

22. Formation and Regeneration of Forest in the Central Provinces:—

Administration report for the year 1925-26:—Progress in regeneration is generally satisfactory. The year's experience confirms that

of last year as regards the necessity for establishing Sal regeneration under cover before making regeneration fellings.

Artificial regeneration under the method of agri-sylviculture has been completed over an area of 5,519 acres in the Amraoti, Buldana and Akola Divisions. The area where regeneration was still in progress at the end of the year was 4,884 acres.

.....Successful sowing of Babul (*Acacia arabica*), Nim, (*Azadirachta indica*), Khair, (*Acacia catechu*), etc., in Yeotmal (170 acres), of Sewan (*Amelina arborea*) (17 acres) in Amraoti deserves mention. Stress is laid on the advisability in the Northern and Southern circles of seriously trying to raise Teak in conjunction with field crops.

As regards teak, regeneration by coppice remained very successful throughout. Teak seedling regeneration varied considerably with local conditions. In Berar generally it was fair only, and in parts of the Southern circle it was reported to be suffering from dense grass growth.

It is noteworthy that in South Chanda fire-protection is deprecated and in Nagpur-Wardha advocated. The observations of Divisional Forest Officers increasingly tend to show the necessity for close study of local conditions in every case. Variation in rainfall appears the main factor. Different methods have different effects in different places and controversy based on generalizations is barren of useful result.

Bija (*Pterocarpus Marsupium*) is reported to have seeded prolifically in several divisions.

The beneficial effects of thinnings are becoming increasingly evident, the necessity for a definite programme of thinning for the period of the rotation being emphasised during the year. The conduct of the work has been systematised as far as possible for divisions where the working plan has still many years to run.

—*Review of Science and practice of Agriculture, October 1927.*

* * *

Additions to the M. F. C. Library.

1. Fauna of British India—Birds. Vol. IV. By, Stuart Baker.
2. Manual of Forest Engineering and Extraction: By, J. F. Stewart.
3. Building construction for beginners By, J. W. Riley.
4. Rivington's note on Building construction: By W. Noble
'Twelvetrees.
5. Building construction. Part III. Materials.

Publications received:—

1. 'The International Review of the Science and Practice of Agriculture,'—October to December 1927.
2. "The junglewallah" January 1927 to April 1928.
3. "The journal of the Madras Agricultural Student's Union." — September to December 1927.
4. "Rural India"—December 1927 to February 1928.

Gazette Notifications.

13—12—1927.

Mr. J. W. K. Wernham, Forest Utilization officer, leave on average pay for eight months from 1-4-28 or date of relief and leave on half average pay in continuation thereof for one year.

Mr. J. S. D. Connolly, Forest Research officer, leave on average pay for eight months, and in continuation thereof, leave on half average pay for one year and three months with effect from 15-3-28 or date of relief.

Mr. P. W. F. Walpole, E. A. C. of Forests, on leave, extension of leave on half average pay for one month in continuation of the leave already granted.

20—12—1927.

Mr. H. G. Hicks, D. F. O., N. Coimbatore, leave on average pay for 6 months from 4-1-28 and leave on half average pay for 5 months & 19 days in continuation thereof.

Mr. V. G. Darrington, Senior Instructor, Madras Forest College, leave on average pay for eight months from 4-1-28 and leave on half average pay for three months and 19 days in continuation thereof,

Mr. H. R. M. Law, D. F. O., S. Kurnool, leave on average pay for 19 days with effect from 3-12-27

The leave granted to Mr. W. G. Dyson, D. F. O. Nilgiris, will take effect from 1-4-28 or date of relief instead of 20-3-28 as ordered.

Mr. D. F. Stileman, D. F. O., Madura, on relief by Mr. J. A. Master, to be Senior Instructor, Madras Forest College, *vice* Mr. V. G. Darrington, granted leave.

ii.

Mr. George Venugopal, D. F. O., W. Kurnool to be in additional charge of S. Kurnool Division from 3-12-27 until relief by Mr. B. K. Roy.

Mr. S. K. Basu, Dupty Conservator of Forests, to be D. F. O., S. Cuddapah Division in relief of Mr. B. K. Roy.

Mr. B. K. Roy, D. F. O., S. Cuddapah, on relief by Mr. S. K. Basu, to be D. F. O., S. Kurnool Division.

Mr. H. R. M. Law, D. F. O., S. Kurnool, to be D. F. O., N. Coimbatore Division with effect from 4-1-28.

M. Amir Padsha Sahib Bahadur, E. A. C. of Forests, is on return from leave, attached to the Central Salem Division.

Mr. N. S. Ghate, A. C. F., on completion of his training in the Nilambur Division on 20-12-27, is posted to charge of Shevroys South Range (Head quarters, Salem), Central Salem Division.

27-12-1927.

M. R. Ry. C. M. Belliappa Avl., E. A. C. of Forests, Nilambur, leave on average pay for one month and fifteen days with effect from 4-1-28 with permission to prefix the Christmas holidays.

10-1-1928.

M. R. Ry. B. S. Kesava Vittal Avl., E. A. C. of Forests attached to the II Circle, on return from leave, to be Assistant Working Plans Officer.

Mr. P. Govinda Menon, D. F. O., Upper Godavari granted privilege leave for one month with effect from date of relief by Mr. P. Venkatramanan.

17-1-1928.

Mr. K. T. Matthew, A. C. F., N. Mangalore Division will be attached to the S. Mangalore Division until further orders.

iii.

The posting of M. Amir Padsha Sahib Bahadur to the Central Salem Division is cancelled. He will on return from leave be attached temporarily to the N. Salem Division.

24-1-1928.

Mr. H. P. Ward, on return from leave, will be posted to be Assistant Forest Utilization officer, Madras.

Mr. V. S. Kuppusami on relief by Mr. Ward will be Assistant Forest Utilization officer, West coast, with Head quarters at Coimbatore.

7-2-1928.

Mr. A. M. C. Littlewood, Deputy Conservator of Forests, extension of leave on average pay for 16 days with effect from 11th March 1928, and on return from leave to be Forest Research officer, Ootacamund.

From the 29th December 1927, Mr. H. Tireman, C. I. E., Officiating Inspector-General of Forests, and President, Forest Research Institute, and College, Dehra Dun, reverted to his substantive appointment of Chief Conservator of Forests in Madras.

14-2-1928.

Mr. F. R. Madan, acting Conservator of Forests, leave on average pay for four months with effect from January 1928.

Mr. M. F. Bridge, Forest Economist, on relief by Mr. J. A. Master, to be D. F. O. Nilgiris, vice Mr. W. G. Dyson, granted leave.

Mr. J. A. Master, D. F. O., Madura, on relief by Mr. A. L. Griffith, to be Forest Economist, Madras

Mr. J. C. Wrench, Deputy Conservator of Forests, on return from leave to be D. F. O. Madura.

Mr. H. P. Ward, Assistant Forest Utilization officer, West Coast, to be Assistant Forest Utilization officer, Madras, with effect from 19-1-1928.

iv.

Mr. V. S. Kuppasami, Assistant Forest Utilization officer, Madras, on relief by Mr. Ward, to be Assistant Forest Utilization officer, West Coast.

Mr. C. R. Ranganathan, A. C. F., in charge of Kanoth range, Wynaad Division is posted for special duty under the Conservator of Forests, III (working plans) Circle.

Mr. E. K. Krishnan, E. A. C., Wynaad Division will be attached to the Ganjam Division with effect from the date of his joining duty in that division.

Mr. N. Trimurthi, A. C. F., in charge, Mudumalai range, Nilgiris, is posted as Assistant to the D. F. O., Nilambur.

21—2—1928.

Mr. D. F. Stileman, D. F. O., Madura, is attached to the Forest College, Coimbatore, from 15-12-27 to 3-1-28.

Mr. P. Govinda Menon granted extension of leave for two months, the first 27 days as privilege leave and the remainder as furlough on half average pay.

Mr. A. L. Griffith, A. C. F., Madura Division is posted to act as D. F. O. Madura from date of his relieving Mr. J. A. Master, until he himself is relieved by Mr. J. C. Wrench.

Mr. H. E. Brown, E. A. C. of Forests attached to the S. Coimbatore Division will be attached to the Wynaad Forest Division.

28—2—1928.

M. R. Ry. Rao Sahib K. R. Venkataramana Ayyar Avl., Deputy Conservator of Forests (on leave) to act as Conservator of Forests, II Circle Bellary, with effect from 7th January 1928.

Mr. K. T. Mathew, A. C. F., S. Mangalore Division will be attached to the Saw mills division, with effect from 1st March 1928.

v.

Mr. P. W. F. Walpole, E. A. C., will on return from leave, be attached to the logging Engineering Division with head quarters at Ootacamund.

M. Amir Padsha Sahib Bahadur, E. A. C., N. Salem Division, will be attached to the Central Salem Division with effect from 1st March 1928.

6—3—1928.

M. B. Ry. C. M. Bellippa Avl., E. A. C., granted extension of leave on average pay on medical certificate for six months with effect from 19th February 1928.

13—3—1928.

M. B. Ry. S. Ragunatha Rao Avl., A. C. F., granted leave on average pay on medical certificate for four months, with effect from 5th February 1928.

20—3—1928.

Mr. D. T. Barry, Conservator of Forests, with effect from 6th June 1928 or date of relief leave on average pay for three months and twelve days and in continuation thereof, leave on half average pay for two years and eighteen days.

Extension of leave has been granted to the following officers for the period noted against each. They have also been permitted to return to India after the expiry of the leave.

Mr. J. C. Wrench, D. C. F.,—leave on medical certificate on half average pay for 2 months from 18th April 1928.

Mr. J. A. Wilson, D. C. F. leave on average pay for nine days from 9th April 1928.

Mr. E. M. Crothers, D. C. F.,—granted leave on average pay for one month and 21 days from 11-4-28, with permission to prefix the Easter holidays to the leave.

vi.

Mr. N. Tirumurthi, A. O. F., Nilambur Division is posted to act as D. F. O. Nilambur, during the absence of Mr. Crothers on leave.

Mr. M. S. Rangaswami, E. A. C., granted extension of leave for four months with effect from 16-12-27 as follows: Leave on average pay on medical certificate for one month and four days followed by leave not due on half average pay (on medical certificate) for two months and 26 days.

27-3-1928.

Mr. A. Wimbush, Conservator of Forests, leave on average pay for seven months and 21 days and in continuation thereof, leave on half average pay for two months and 24 days with effect from 4th June 1928 or date of relief.

Mr. H. P. Wood, Assistant Forest utilization officer, Madras, to act as Forest utilization officer, until further orders, vice Mr. J. W. K. Wernham granted leave.

Mr. V. S. Kappaswamy, Assistant Forest utilization officer, West Coast, to act as Assistant Forest utilization officer, Madras until further orders, vice Mr. H. P. Ward.

The services of M. R. Ry., T. V. Venkateswara Ayyar Avl., Assistant Instructor at the Forest Research Institute and College Dehra Dun, are replaced at the disposal of the Government of Madras with effect from the afternoon of 29th February 1928.

vii.

Notifications relating to Rangers.

22-12-1927.

With effect from 13-6-27 vice M. R. Ry. K. M. Gopalachari, Ranger III Grade, permanently reduced to the IV Grade :—

M. R. Ry. P. Miranda, Ranger IV Grade permanent, to be Ranger III Grade permanent;

2. With effect from 1-7-27 vice M. R. Ry. K. R. Krishna Ayyar, Ranger III Grade, permanently reduced to the bottom of the IV Grade.

M. R. Ry. A. Siddhan Pillai, Ranger IV Grade, permanent, to be Ranger III Grade permanent.

22-2-1928.

With effect from 1-12-27, vice M. R. Ry. T. N. Seshagiri Rao, Ranger I grade, retired.

FROM II GRADE TO I GRADE :—

M. R. Ry. P. Ramunni Menon Ranger II Grade permanent to be Ranger I Grade permanent.

FROM III GRADE TO II GRADE :—

M. R. Ry. R. Subramania Ayyar, Ranger III Grade permanent and II Grade sub protom to be II Grade permanent.

31-1-1928.

1. M. R. Ry. A. P. Srinivasa Iyengar Ranger III Grade is granted privilege leave for 2 months and 25 days and furlough for 6 months in continuation thereof with effect from the date of relief.
2. M. R. Ry. B. K. Krishna Rao, Ranger III Grade transferred from the First Circle to the Utilization Division, is posted to be in charge of the Government Timber Depots, Kashtgod, and Parappa.

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2-3-1928.

Mr. K. C. Joseph, Ranger IV Grade Forest Engineer's Division, Madras, is transferred to the Logging Engineer's Division for work in the New Amarampalam Mapping and Cruising Project, Nilambur.

He should report for duty to Mr. B. Janakiram Singh, Assistant Conservator of Forests in-charge of the Project on the 10th March 1928.

First Circle.

17-12-1927.

Mr. J. D. David, Ranger I grade is granted leave on average pay on medical certificate for 4 months in continuation of 5 weeks leave on average pay granted.

28-12-1927.

Mir Abdul Hussain Kirimani Saheb, Ranger III grade, is transferred from Vizagapatam to Ganjam. He should hand over to Range officer Sarvasidhi Range and proceed to Ganjam expeditiously.

30-12-1927.

M. R. Ry. B. S. Sankaran, Ranger VI grade on return from leave is posted to the Nellore District for the charge of the Udayagiri cum Kanigiri Range.

2. On relief by No. 1 M. R. Ry. C. T. Thiruvengdam, Ranger V grade is transferred to Upper Godavari vice B. S. Sankaran.

31-12-1927.

M. R. Ry. Y. Venkatasami Naidu, Range officer, Cherla, is granted leave on average pay on medical certificate for 3 months from the date of relief.

7-1-1928.

M. R. Ry. K. Baghava Rao, Ranger VII grade, Devagiri Range of Parlakimidi Maliahs is granted extension of leave on medical

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certificate for 2 months on average pay and 2 months on half average pay from 1-1-1928 in continuation of the leave for 6 months already granted.

7-1-1928.

The leave on average pay for 20 days granted to M. R. Ry. B. K. Krishna Rao, Range officer, Sathiavedu is cancelled as it was not availed of.

9-1-1928.

M. R. Ry. P. Doraswamy Iyer, Ranger III grade, Sreeharikota Range Nellore Division, is granted extension of leave on average pay on medical certificate for 2 months in continuation of the leave for 2 months granted.

9-1-1928.

M. R. Ry. N. Chakrapani Iyengar, Range officer, Chandragiri Range is granted extension of leave on medical certificate for 2 months in continuation of 4 months leave granted.

10-1-1928.

M. R. Ry. D. Krishnaswamy Ranger VI grade is granted extension of leave on average pay for 2 months on medical certificate in continuation of leave for 2 months granted.

10-1-1928.

M. R. Ry. B. S. Sankara Iyer, Ranger VI grade is granted extension of leave on half average pay on medical certificate for 4 months from 12-1-1928 in continuation of the leave granted.

15-1-1928.

1. M. R. Ry. P. Dorasami Iyer, Ranger III grade to the Sathiavedu Range, Nellore District. This cancels his posting to special duty in Palakonda Range.

x.

2. M. R. Ry. D. Ramakrishnayya, Ranger V grade to Udayagiri Range, Nellore District. This cancels his posting to special duty in Upper Godavari.
3. M. R. Ry. N. Chakrapani Iyengar, Ranger VI grade to Mahendra Range, Parlakimidi Maliahs.
4. M. R. Ry. D. Krishnaswamiah, Ranger VI grade to Chandragiri Range, Parlakimidi Maliahs.

4—2—1928.

Supernumerary Ranger Y. Vidyatham on special duty in the Palakonda Range, is granted leave on average pay for 3 months on medical certificate from 13-11-1927.

7—2—1928.

On expiry of the leave on average pay on medical certificate granted to Supernumerary Ranger Y. Vidyatham he is posted to Ganjam district.

19—3—1928.

M. A. H. Kirmani Sahab, Ranger IV grade is granted leave on average pay from 10-1-1928 to 21-3-1928 both days inclusive subject to eligibility.

19—3—1928.

On relief of Kukuluba Range charge by Ranger M. A. H. Kirmani Sahab, Supernumerary Ranger Y. Vidyatham is transferred to Balliguda.

2. On relief by No. 1 Mr. C. S. King, Ranger III grade is granted leave on average pay for 4 months.

21—3—1928.

Mr. V. N. Leapingwell, Supernumerary Ranger, transferred from II to I Circle is posted to Rampa for duty under the Special Forest Officer.

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2nd Circle.

7—1—1928.

M. R. Ry., S. Chinnadurai Pillai, Ranger II grade, Badvel Range, Cuddapah North Division is granted privilege leave for two months from date of relief by M. R. Ry., S. V. Duraiswami Iyer, Range VI grade.

12—1—1928.

M. R. Ry., K. S. Ramiah, Ranger IV grade, on return from leave on 18th January 1928, is posted to Kurnool South Division to work under the orders of the District Forest Officer.

19—1—1928.

Ranger V. N. Subramania Ayyar, is transferred from special duty in the Anantapur District to the charge of Madanapalle Range in the same Division in relief of Ranger M. R. Ry., K. R. Viswanatha Ayyar transferred to the V Circle.

20—1—1928.

M. R. Ry. T. G. Seetharama Mudaliar Ranger VI grade under orders of transfer from Cuddapah South to Kurnool West Division, is granted leave on average pay for 3 months from 16th January 1928 the date of relief in Cuddapah South Division.

22—1—1928.

Mr. J. B. Rodrigues Supernumerary Ranger Kurnool West Division is granted extension of leave on average pay for one month and 13 days from 22-12-27 to 3-2-1928 in continuation of the leave already granted.

27—1—1928.

M. R. Ry., K. S. Ramiah Ranger, IV grade is granted an extension of leave on average pay for 2 months from 13-1-1928 in continuation of the leave already granted.

11—2—1928.

Mr. J. B. Rodrigues, Supernumerary Ranger, Kurnool West Division is granted an extension of leave on full average pay from 4-2-1928 to 3-3-1928 in continuation of leave already granted.

14—2—1928.

M. R. Ry., T. K. Ramaswami Ayyar Ranger II grade in charge of Chitvel Range, Cuddapah South Division is granted leave for 4 months as follows from 1-4-1928 or date of relief thereafter.

2 months 6 days on full average pay.

6 months 20 days on half average pay.

17—2—1928.

Mr. V. N. Leapingwell Supernumerary Ranger Kurnool South Division is granted an extension of leave on average pay for a period of 2 months from 20-2-1928 in continuation of the leave already granted.

25—2—1928.

1. M. R. Ry., S. V. Duraiswami Ayyar Ranger VI grade, in charge of Badvel Range, North Cuddapah District to the VI Circle.

2. M. R. Ry., K. S. Ramiah, Ranger VI grade (due to rejoin from long leave on 18-3-1928) to the VI Circle.

3. M. R. Ry., G. Rama Rao, Ranger IV grade, in charge of Chelama Range Kurnool South Division to the I Circle.

Nos. 1 and 3 should join expeditiously immediately after they hear from the Conservators concerned about the place where they should join.

4. M. R. Ry., A. Bhaviah, Ranger V grade, in charge of Porumilla Range, North Cuddapah Division will relieve No. 1 forthwith and be in additional charge of the Badvel Range until further orders.

5. M. R. Ry., S. Sankaran, Ranger V grade, in charge of Giddalore Range to relieve No. 3 forthwith and be in additional charge of the Chelama Range until further orders.

3—3—1928.

M. R. Ry., T. Sreeramulu Nayudu Ranger VII grade on return from leave is posted to Vempalle Range, Anantapur Division in relief of No. 2.

2. M. R. Ry., G. Devanayagam Nayudu Ranger IV grade (Vempalle Range) Anantapur Division on relief by No. 1 is posted to charge of Chelama Range Kurnool South Division—To join expeditiously.

3. M. R. Ry., D. N. Subramania Ayyar VI grade on return from leave is posted to Ganganapalle Range Anantapur Division in relief of No. 4.

4. M. R. Ry., T. Paramasivam Pillai Ranger IV (Ganganapalle Range, Anantapur Division) on relief by No. 3 is posted to Badvel Range Cuddapah North Division. To join expeditiously.

9—3—1928.

M. R. Ry. T. G. Sitarama Mudaliar Ranger VI grade, on return from leave on 16-4-1928, to the charge of Dornal Range, Kurnool East Division.

2. M. R. Ry. H. Thammayya, Ranger III grade; on relief by No. 1, is posted to charge of Markapur Range.

3. M. R. Ry. Y. Peddalakshmayya Nayudu, Ranger V grade, on relief by No. 2, is posted to charge of Badvel Range.

9—3—1928.

M. R. Ry. T. Paramasivam Pillai, Ranger IV grade, Ganganapalle Range, Anantapur Division on relief by M. R. Ry. D. N. Subramania Ayyar is posted to charge of Cuddapah Range, Cuddapah South Division in relief of No. 2.

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Note:—This cancels his posting to Badvel Range (Cuddapah North Division).

2. M. R. Ry. S. M. Krishnaswami Ayyar Ranger IV grade, Cuddapah Range, Cuddapah South Division, on relief by No. 1 is granted leave on average pay for 2 months.

16—8—1928.

M. R. Ry., S. Chinnadurai Pillai Ranger II grade is granted an extension of leave on medical certificate from 11-3-1928 as follows:

Privilege leave for 9 days.

Furlough on half average pay for 21 days, in continuation of the leave already granted.

19—3—1928.

M. R. Ry. T. Paramasivam Pillai Range Officer Ganganapalli will relieve Range Officer Vempalli immediately and will be in additional charge of Vempalli Range until M. R. Ry. T. Sriramulu Naidu joins duty at Vempalli.

25—3—1928.

M. R. Ry., S. Chinnadurai Pillai, Ranger II grade, on return from leave (if he is not able to produce an invalid certificate in the meanwhile) on 11th April 1928, is posted to the charge of Turimella Range, Kurnool East Division vice M. R. Ry., Ranganayakulu Nayudu who has applied for leave.

Third Circle.

30—3—1928.

M. R. Ry. M. N. Raman Pillai, Ranger under the Working Plans Officer, Mount Stuart Division is granted leave on average pay for 10 days with effect from 11-4-1928 with permission to avail himself of the Easter holidays commencing from 5-4-1928.

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Fourth Circle.

9—12—1927.

Mr. J. B. Rodrigues supernumerary ranger on special duty is granted leave on full average pay for one month. He may affix the christmas holidays to the leave.

15—12—1927.

M. R. Ry. P. Mathuramuthu Pillai, Ranger II grade, Krishnagiri Range is granted leave on average pay on medical certificate for 42 days from 3-12-1927.

9—1—1928.

M. R. Ry. V. D. Ramalingam Pillai, Ranger VII grade, is granted extension of leave on average pay on medical certificate for the period from 5-12-1927 to 13-2-1928 in continuation of the leave granted to him.

19—1—1928.

Mr. R. E. Lemos, Ranger I grade is granted an extension of leave on average pay on medical certificate for 3 months from 3-1-1928 afternoon.

27—1—1928.

M. R. Ry. A. Seetharamiah Ranger VI grade Dhone Range is granted leave on full average pay for 18 days from 21-12-1927 to 7th January 1928. He will avail joining time from 8-1-1928 to 15-1-1928 to join the Vernacular Training School on 16-1-1928.

29—1—1928.

M. R. Ry. T. S. Sankaranarayana Ayyar, Supernumerary Ranger, on special duty in Odugathur Range, is granted leave on average pay for 1 month with effect from date of relief.

31—1—1928.

M. R. Ry. T. S. Sankaranarayana Ayyar, Supernumerary Ranger, Vellore Division, is posted for work under the Engineer-in-Chief Cauvery Metur Project.

8-2-1928.

In continuation of this office S. O. 229/27 dated 15-12-1927 M.R.By. P. Mathuramuthu Pillai, Ranger II grade, is granted an extension of leave on average pay on medical certificate for one month from 14-1-1928.

24-2-1928.

M. R. Ry. P. Mathuramuthu Pillai, Ranger II grade, is granted extension of leave on average salary without medical certificate for one month from 14-2-1928.

27-2-1928.

M. R. Ry. T. D. Rajabhadur Mudaliar, Ranger VI grade on return from leave, is posted to the charge of Cauveri Range, Central Salem division, to relieve M. R. Ry. P. K. Subbanarayana Ayyar, Supernumerary Ranger.

2. M. R. Ry. P. K. Subbanarayana Ayyar, Supernumerary Ranger, on relief by No. 1, is posted to North Salem on special duty in connection with the Vernacular Training School.

2-3-1928.

1. M. R. Ry. B. Sambamurthi Ayyar, Ranger IV grade, from Tiruvannamalai Range, Vellore division, to Atur Range, Central Salem division.
2. M. R. Ry. L. H. Narayana Ayyar, Ranger II grade, on relief by No. 1, from Atur Range, Central Salem division, to Tiruvannamalai Range, Vellore division.

No. 1 should relieve No. 2 on 1st April.

3-3-1928.

M. R. Ry. P. Mathuramuthu Pillai, Ranger II grade, on return from leave, is appointed Instructor, Vernacular Training School, North Salem division, for the session 1928.

2. M. R. Ry. P. K. Subbanarayana Ayyar, Supernumerary Ranger is appointed Assistant Instructor, Vernacular Training School.

6-3-1928.

M. R. Ry. V. D. Ramalingam Pillai, Ranger VII grade, Central Salem division is granted extension of leave on average salary, on medical certificate for 2 months in continuation of the leave granted to him.

1-4-1928.

Mr. R. E. Lemos, Ranger I grade, North Salem division, is granted further extension of leave on average pay on medical certificate for 3 months from 4-4-1928 in continuation of the leave granted.

2-4-1928.

M. R. Ry. S. Ramalinga Ayyar, Supernumerary Ranger, in charge of Namagripet Range, South Salem division, is granted leave without medical certificate for 2 months from date of relief, i. e., leave on average salary for 1 month 12 days and leave on half average salary for the remaining period.

2. M. R. Ry. S. Ramanujam Sesha, Ranger VI grade, on special duty in Vellore division, is posted to Namagripet Range, South Salem division, Vice No. 1 granted leave.

2-4-1928.

M. R. Ry. P. A. Krishnaswami Mudaliar, Ranger IV grade, South Salem division, is granted extension of leave without medical certificate for one month from 7-4-1928, i. e., leave on average salary for 28 days and leave on half average salary for the remaining period in continuation of the leave granted.

Fifth Circle.

29-12-1927.

On return from leave M. R. Ry. B. S. Ramaswamy Ayyar, Ranger IV grade Kollegal is posted to charge of Punachi Range, South Coimbatore Division.

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2. On relief by No. 1 M. R. Ry. K. O. Anandan is transferred to North Coimbatore Division on Special Duty.

On return from leave Mr. Fenn, Ranger V grade, is posted as Assistant Ranger, Tunacadavu Range, South Coimbatore Division.

The leave granted to M. R. Ry. A. K. Kunhunni Nair, Ranger V grade is extended by two months on average pay.

17—1—1923.

M. R. Ry. B. S. Ramaswamy Ayyar is granted leave on average pay for 4 months from 16th September 1927 to 15th January 1928.

11—1—1928.

M. R. Ry. C. Tiruvengadam Pillai, Ranger, V Grade, South Coimbatore is granted leave *not due* on Medical Certificate on half average pay for two months from 6th December 1927.

23—1—1928.

M. R. Ry. K. R. Viswanatha Ayyar, Ranger IV Grade transferred from the II Circle is posted to charge of Pollachi Range, South Coimbatore District, Coimbatore.

2. On relief by No. 1 M. R. Ry. A. K. Anantharama Ayyar, Ranger VI Grade will remain in South Coimbatore on special duty.

3. M. R. Ry. N. S. Eswaran, Ranger VI Grade, South Coimbatore, on return from leave, is transferred to North Coimbatore on special duty.

4. M. R. Ry. C. Thiruvengadam Pillai, Ranger V Grade, South Coimbatore on return from leave, is transferred to Kollegal division on special duty.

28—1—1928.

M. R. Ry. S. Sundaravaradachari, Ranger IV Grade, North Coimbatore is granted leave on average pay for two weeks from 16th January 1928.

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11—8—1928.

The leave on average pay granted to M. R. Ry. S. Sundaravaradachari, Ranger IV Grade, North Coimbatore District, is extended by 29 days on Medical Certificate.

14—3—1928.

M. R. Ry. V. Jagannatham Pillai, Ranger VI Grade, in charge of Satyamangalam depot, North Coimbatore District is granted leave on average pay for one month from or after 15th April 1928.

2. A. Sitarama Sarma, Forester will be in charge of the Satyamangalam depot.

Sixth Circle.

21—12—1927.

M. R. Ry. S. Venkatarama Ayyar, Supernumerary Ranger, is transferred from the Nilambur division to the Wynad division. To join forthwith.

23—12—1927.

Mr. Thomas Thachil, Ranger III grade, in charge of Beltangady Range, South Mangalore Division is granted leave on average pay on medical certificate for one month from date of relief.

11—1—1928.

Mr. E. K. Krishnan, Extra Assistant Conservator of Forests, and assistant to the District Forest Officer, Wynad, will, in addition to his own duties and without change of head-quarters viz., Manantoddy, hold charge of the Sultan's Battery Range temporarily from 23rd Decr. 1927 in relief of Mr. M. P. Subbayya.

2. Ranger Mr. M. P. Subbayya, VI grade on relief from the Sultan's Battery Range, is transferred to the Begur Range with effect from 25th Decr. 1927.

11-1-1928.

M. R. Ry. P. Sankunni Nayar, Ranger VI grade, on special duty in the Begur Range, is granted leave on average pay on medical certificate for one month and 20 days from 4th January 1928 with permission to prefix the holidays from 25th Decr. 1927 to 3rd Jany. 1928 inclusive.

30-1-1928.

Mr. A. Joseph, Ranger, VI grade, attached to the Mudumalai Range, is granted leave on average pay on medical certificate for four months and 2 days from 21-12-1927.

6-2-1928.

M. R. Ry. A. Rama Hebbar, Ranger II grade, in charge of the Kasaragode Range, South Mangalore Division, is granted leave on average pay for one month and 11 days from date of relief.

6-2-1928.

M. R. Ry. K. Shankaranarayana Rao, Ranger V grade, from the Palghat Range to the Kasaragode Range, South Mangalore Division, on relief by Mr. E. A. Lasrado Assistant Conservator of Forests, who will hold charge of the Palghat Range temporarily.

2. M. R. Ry. P. Madhavan Nair, Supernumerary Ranger, due back from leave on 17th February 1928, is posted to the charge of Coonoor Range, Nilgiri Division in relief of No. 3.

3. M. R. Ry. K. Dooma Shetty, Ranger V grade, in charge of Coonoor Range, is transferred to be Range Officer, the Chedleth Range, Wynaad division, on relief by No. 2:

4. M. R. Ry. P. Sankunni Nair, Ranger VI grade, due back from leave on 24-2-1928, is posted to the Nilambur Division as Assistant Ranger, Amarampatam Range.

8-2-1928.

M. R. Ry. P. Sankunni Nair, Ranger VI grade, due back from leave on 24th February 1928, is posted to the Wynaad division to the charge of Kannothe Range. He should not avail full joining time.

17-2-1928.

M. R. Ry. A. Rama Hebbar, Ranger II grade, in charge of the Kasaragode Range, South Mangalore Division, is granted leave on average pay on medical certificate for 8 months from 6-2-28 or date of relief.

28-2-1928.

M. R. Ry. S. V. Doraiswami Ayyar, Ranger VI grade, to the charge of Mangalore Range, North Mangalore Division.

2. M. R. Ry. K. S. Ramayya, Ranger IV grade, to the charge of Mudumalai Range, Nilgiris division, on the expiry of his leave on 13-3-28.

28-2-1928.

Mr. Thomas Thachil, Ranger III grade, is granted an extension of leave on average pay on medical certificate for 4 months in continuation of the leave granted.

19-3-1928.

M. R. Ry. S. V. Doraiswami Ayyar, Ranger VI grade, from the Mangalore Range, North Mangalore Division to the Uppinangadi Range, South Mangalore Division.

2. Mr. J. A. Aranha, Ranger I grade, from the Uppinangadi Range to the Mangalore Range.

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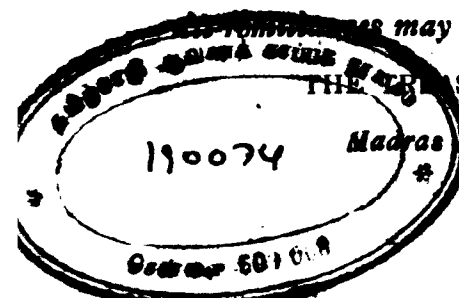
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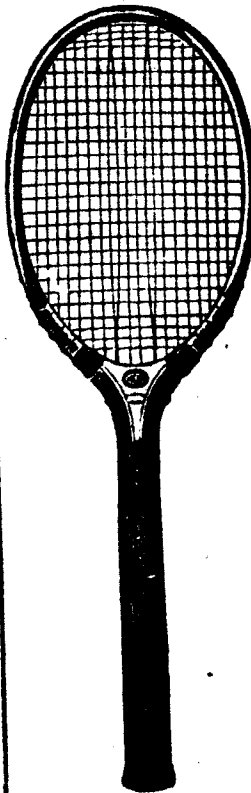
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INDEPENDENT OPINION.

Mr. George King, F. F. A., F. I. A., one of the oldest and most experienced Actuaries of London and the Editor of the Text book of the Institute of Actuaries, London, says in his report on the first valuation of the India Equitable Insurance Co., Ltd.—

"So far as my experience goes, scarcely any Insurance Co. (other than the India Equitable) has previously been able to make a net premium valuation only four years from the date of its establishment and to declare a bonus."

The same authority in his Report on the last valuation of the Company says, in recommending a higher rate of bonus, than that recommended in the previous valuation and in congratulating the Shareholders and the Policy-holders of the Company :—

"The very satisfactory position which the valuation discloses....."

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