

67

DODABETTA PLANTATION.

Acres 320.47, elevation over 7,000 feet.

91. Ascending to the plantations from the Government Gardens the first thirteen plots as follows are on the slope looking down on to Ootacamund or with a south-west exposure.

92. No. XXI, 1868, A.—1.61 acres, chiefly grass land with a little shola at the bottom of ravine, all planted with *Officinalis* 7' x 7'; ground very steep and soil being gradually washed away; growth in fair condition and not many failures since the renewals were put down four years ago which are doing well; no late renewals, too steep for terracing, average height of the trees 15 feet; 714 trees barked once, 11 trees barked twice.

93. No. XXVI, 1869, B.—3.22 acres, nearly all grass land, very steep, soil gravelly, and being rapidly washed away, but too steep for terracing; all planted with *Officinalis*; trees healthy, but very far apart owing to the original wide planting, and many failures; many renewals were put down three years ago, which are doing well, but none since; average height 15 feet; 1,138 trees once barked, remaining trees small.

94. No. XXV, 1869, A.—4.68 acres, grass land, very steep; remarks the same as for No. XXVI. A portion was terraced in 1880; remainder too steep for terracing; 2,295 trees barked once, 70 trees barked twice.

95. No. I, 1863, A.—2.32 acres, all shola land, steep, and the soil has been subject to much wash, but the whole plot was terraced in 1880; all planted with *Officinalis* 8' x 8'; trees average height 20 feet, not in very good condition; trees very far apart owing to wide planting and subsequent failures; renewals about 10 per cent. put down three years ago, no later renewals; 967 trees barked four times, 161 trees barked once, remainder small and not barked.

96. No. II, 1863, A.—1.67 acres, all shola land, planted with *Officinalis* 7' x 7'; trees healthy; average height 22 feet, but there have been many failures; renewals one to four years of age; 1,221 trees barked five times, 47 trees once.

97. No. III, 1863, C.—3.57 acres, all shola land, planted with *Officinalis*; condition fair, but trees very far apart from very wide planting; average height of original trees 22 feet, many renewals one to four years of age; 1,959 trees barked five times, 65 trees once. There are a few "*Pahudiana*" not growing well; also one "*Angustifolia*" growing well.

98. No. VI, 1864, B.—7.28 acres, originally patches of shola dovetailing with grass land, very steep, and soil much washed away, but the whole was terraced in 1880, planted with "*Officinalis*," except some 50 *Succirubra*; condition bad; 6,000 seedlings planted out in alternate lines in 1880; 4,969 trees barked four times, 2,146 barked twice, 311 once.

99. No. V, 1864, A.—4.06 acres, all shola land, steep, terraced in 1880, all planted with *Officinalis* 8' x 8' and 7' x 7', condition fair; lately thicker planting has been attempted, 2,500 seedlings being put out in alternate lines doing fairly well; pits have also been dug for further planting; 1,900 trees barked three times, 167 barked once; 400 trees have lately been scraped on the Java principle, some are mossed and some left bare; all are renewing their bark, but those mossed more rapidly.

100. No. IV, 1863, D.—0.98 acre, all shola land, planted with *Officinalis*; trees fair growth, but very far apart; 900 late renewals, and now pitted for further planting. 556 trees barked five times, 58 trees once.

101. No. XVII, 1867, A.—5.62 acres, grass land, planted with *Officinalis*; condition good, but trees much branched from wide planting, intermediate planting between the old trees last year to an extent of 1,800 seedlings doing well; a small area where the ground is level nearly all gone out from frost; 2,853 trees barked twice, 830 trees once.

102. No. XX, 1867, D.—4.92 acres, grass land, *Officinalis*; condition fair, average height 14 feet; very few failures; original planting 6' x 6'; 2,572 barked twice, 644 trees once; 5 trees coppiced in June 1880 as dying; no re-growth.

71
103. No. XVIII, 1867, B.—6.24 acres, grass land; condition fair, but growth rather stunted; 8' to 10' in height only; originally; planted 7' x 7'; no late renewals; 2,241 trees barked twice, 1,539 trees once.

104. No. XIX, 1867, C.—5.90 acres, grass land, growth stunted; 6' to 8' in height; trees gone out on a flat portion of about 1 acre said to be caused by frost; 1,692 trees barked twice, 1,314 trees once, 28 trees cut down dead from frost.

105. The next plot, No. X, is chiefly on the ridge or saddle; all the remainder, 25 in number, are over the saddle, and have a north-east exposure, except small portions of Nos. IX and XXVII which over-top a grass hill and face south-west.

106. No. X, 1866, A.—7.44 acres, grass land, but a little shola in hollows, chiefly hill-top, much blown; growth stunted and many failures; growth better in hollows; 1,007 trees barked twice, 351 trees once.

107. No. XI, 1866, B.—12.18 acres, about two-thirds shola, one-third grass land, Officinalis; growth good; 4,627 trees barked three times, 2,615 trees twice, 1,859 trees once. 5 acres, twice barked trees, upper portion (shola land) coppiced in 1879; 3,350 trees cut, 157 have failed to sprout; growth good of remainder.

108. No. XXVIII, 1869, D.—15.33 acres grass land, Officinalis, planted 7' x 7'; condition fair but growth stunted; height 8 to 10 feet, not barked; no late renewals but now pitted for intermediate planting to an extent of about 35 per cent.; 5 acres coppiced in 1879; 2,493 unbarked trees cut, failures 400; coppice growth of the rest good; 400 seedlings planted to re-place the casualties, 100 unbarked trees scraped in October 1880, some mossed and some left bare, all are renewing their bark, but those mossed renew more rapidly.

109. No. XXIX, 1869, E.—8.05 acres, grass land, Officinalis; growth good in the lower portion only a small area, rest very patchy from many failures; trees healthy but stunted; no renewals the last three years; 2,467 trees barked once, eight large dead trees felled.

110. No. XXIV, 1868, D.—13.37 acres, grass land and fern land, Officinalis; a rather flat portion of about 3 acres suffers from frost, and has gone out almost entirely; in the remainder growth stunted, but fairly healthy; many failures; no late renewals; 3,579 trees barked once. Five old dead trees cut down. Twenty-one *Angustifolia* trees not growing very well.

111. No. XIV, 1866, E.—4.33 acres, shola land, Officinalis; growth average, but a good many failures from frost; several spots quite bare; no renewals since four years; 715 trees barked three times, 672 trees barked once.

112. No. XXII, 1868, B.—6.04 acres, grass land, Officinalis, originally planted 7' x 7'; many failures, and trees far apart; growth generally stunted, but fairly healthy; no renewals since four years; 706 trees barked twice, 1,709 trees once.

113. No. XXIII, 1868, C.—11.76 acres, fern land, Officinalis; very poor growth with numerous gaps, the rank growth of the common Bracken (*Pteris aquilina*) is robbing the soil of much of its virtue; it should be thoroughly eradicated as far as possible, and this plot should be pitted and planted up; 1,895 trees barked twice, and 1,302 once, two old dead trees cut down.

114. No. XV, 1866, F.—3.24 acres, about 1 acre shola, the rest grass land, Officinalis; growth poor and stunted, and many failures; 1,412 trees barked three times, and 697 trees once.

115. No. XII, 1866, C.—11.16 acres, shola land, Officinalis; growth good but patchy in places from many failures; 3,573 trees barked three times, 1,771 trees once; no renewals since four years.

116. No. XXXIX, 1873.—1.81 acres, shola land, 44 large *Pitayensis* trees; growth good, 15 feet high, not barked, except four for analysis; 557 large Officinalis doing very well, not barked; 1,000 Officinalis put down in 1880.

117. No. XIII, 1868, D.—12.68 acres, shola land, and good soil, very steep in parts, and subject to much wash, but was terraced in 1880; trees have been pruned

7B

and the growth is good and promising, but does not cover the ground which is steep and rocky in places, originally planted 8' x 8' which has prevented straight growth of boll; height of trees 8 to 15 feet; there was a good deal of intermediate planting four years ago; 2,971 trees barked four times, 1,524 trees once.

118. No. VII, 1865, A.—10.20 acres, shola land, soil very good, ground terraced in 1880, chiefly *Officinalis*; growth very good, originally planted 7' x 7', but not very regularly, fairly covers the ground, trees 16 to 18 feet high; 6,601 trees barked four times, 816 trees once; there is a gap in one portion of about half an acre which has been re-planted twice, but has failed owing to frost.

About 100 *Calisaya* trees, growth thin and lanky.

A few *Pubescens* trees growing very luxuriantly; 26 *Micrantha* and *Succirubra*; growth very poor.

One of the best plots on the north-east side of the hill.

119. No. XVI, 1866, G.—9.57 acres, shola land, *Officinalis*, planted 7' x 7'; growth good, but suffers somewhat from frost, does not cover the ground and requires intermediate planting; renewals 15 per cent. four years ago, of which many have failed; 1,000 seedlings put out in 1880; 3,622 trees barked three times, 1,484 trees once.

120. No. XXXV, 1869, K.—6.40 acres, shola soil, a very steep ravine and very irregularly planted with *Officinalis*, all lately terraced; growth good on slopes, but trees generally very far apart; about lower portions of the ravines large gaps owing to failures from frost; 531 trees barked twice, 1,663 trees once; there is one *Micrantha* tree not showing good growth, and a few *Pubescens* with very fine growth.

121. No. XXXVIII, 1872.—8.36 acres, chiefly grass land, steep hill side, soil poor and gravelly, *Officinalis*; growth poor and many failures, suffers from frost and much blown; many renewals, amongst which there are failures, re-pitted in portions for intermediate planting; the extreme upper portion suffers much from frost and wind, and has almost entirely gone out; and it would be useless to re-plant this; the upper portion of the slope has been lately terraced, and should be planted up; the Bracken should be eradicated as it is robbing the soil; about one acre shola land in the lower portion of the plot exhibits good growth; trees not barked.

122. No. XXXIV, 1869, J.—7.28 acres, grass land, planted with *Officinalis*, steep, rocky, and gravelly, very poor growth, many failures; 567 trees barked twice, 1,746 trees once; six old trees cut down.

123. No. XXXIII, 1869, I.—12.33 acres, grass and fern land, *Officinalis*, except a few *Pubescens*; very steep, several small land-slips; trees far apart and very irregular, at least 25 per cent. failures; a very poor plot; 271 trees barked twice, 3,487 trees once.

124. No. XXXII, 1869, H.—12.82 acres, grass and fern land, steep with rocky, gravelly, poor soil, planted with *Officinalis*; growth very poor and numerous failures; 627 trees barked twice, 2,150 trees once; 300 seedlings planted out in 1880.

125. No. XXXI, 1869, G.—14.08 acres, grass and fern land, steep and gravelly, *Officinalis*; growth very poor and numerous failures; 707 trees barked twice, 2,242 trees once; four old dead trees cut down.

126. No. XXX, 1869, F.—17.62 acres, grass land and fern, steep and gravelly, *Officinalis*; very poor growth and thin from many failures; 2,643 trees barked twice, 2,113 trees once; 11 old dead trees cut down.

127. These last five plots of 1869 planting, viz., F, G, H, I, and J form the lower portion of the north-east side of the Dodabetta Plantation, and are by far the least successful, and the trees will never cover the ground, as there are considerable portions on which growth will always fail; there is, however, here and there much fern land, on which there is now a rank growth of Bracken robbing the soil; and if money was expended in up-rooting this, the growth of the *Chinchona* might be much improved in these portions.

75
128. No. XXXVII, 1870.—8.92 acres, grass land, planted with *Officinalis*; much of the plot is hill top with poor rocky soil; the trees were originally put down at 7' x 7', but they are now very far apart from many failures, and the growth is poor and stunted, generally from 5' to 10' in height; intermediate planting up should be undertaken, but there are several perfectly bare spots on which perhaps planting would not succeed; 168 trees barked twice, 1,295 trees once.

129. No. XXXVI, 1869, L.—2.19 acres, grass land, planted with *Officinalis*; poor rocky soil; trees far apart and of stunted growth; height 5 to 10 feet; 176 trees barked twice, 100 trees once.

130. No. VIII, 1865, B.—17.54 acres, grass land, good loam, planted with *Officinalis* 7' x 7'; growth good; trees average 15 feet high; not many failures; renewals 10 per cent. some four years ago, none since; 7,567 trees barked four times, 2,347 trees once.

131. No. IX, 1865, C.—13.65 acres, grass land, good sub-soil, planted with *Officinalis*; growth good, but somewhat stunted; trees 10 to 13 feet high; rather too much exposed to the north-east monsoon; renewals 15 per cent. some four years ago, none since; not many failures; the trees covering the ground well; 7,602 trees barked four times, 3,605 trees once.

132. No. XXVII, 1869, C.—14.50 acres, grass land; little shola land in ravine; soil generally good, but situation high and exposed; planted with *Officinalis*; growth fair but stunted; some of the highest part gone out; growth good towards bottom of plot; 207 trees barked twice, 1,618 trees once.

133. Nurseries.—The nurseries are in good order; in the Dodabetta nursery there are 2 lakhs of *Officinalis* seedlings.

In the nursery near the jail about 10,000 *Officinalis* seedlings; also 10,000 rooted cuttings of *Angustifolia* transferred from the propagating houses.

In the lower nursery (near the tea) there are 20,000 *Officinalis* seedlings.

134. Glass Houses.—In the glass propagating houses 12,000 *Calisaya Ledgeriana* seedlings (from Java), 100 *Pitayensis* seedlings from plantation trees, 400 *Pubescens* seedlings from plantation trees, 40 *Calisaya* seedlings from plantation trees, 100 stock plants of *Angustifolia*; also the "Santa Fe" and "Carthagenia" plants brought lately by Mr. Cross.

135. State of Dodabetta Plantation.—This I consider on the whole promising, and there can be no doubt as to their paying well; the great mistake has been wide planting at the commencement, and every endeavour must now be made to plant up closer, but this is receiving every attention; the plantations have been much improved of late in places by terracing, but in some parts the land is too steep for this, and should never have been opened; there are besides large blocks where the soil is very poor, and where planting must be always more or less a failure, though it will pay at the present high prices of bark; the effects of frost and wind are also very evident in many places. The eradication of the bracken fern in some of the plots requires immediate attention, and would greatly improve the growth of the *Chinchona*.

136. Coppicing.—In Plot No. XI, 1866, 3,350 "*Officinalis*" trees (5 acres) which had been twice barked previously were coppiced during the first ten days in June 1879; the stools bled very much and 157 died; the coppice growth of the rest is good—

Yield in green bark = 13,762 lb.

Yield in dry bark = 5,400 lb.

In Plot XXVIII, 1869, 2,493 unbarked *Officinalis* trees (5 acres) were coppiced from 13th to 19th June 1879; they bled very much and 400 stools died; the coppice growth of the rest being good—

Yield in green bark = 4,853 lb.

Yield in dry bark = 1,700 lb.

I attribute the failures to the coppice having been carried out too late in the season; it is noteworthy that here, as at Naduvatam, there are many more deaths amongst the stools of the unbarked trees than from those which had been barked, which is proof that the root system of the tree does not suffer in any way from the barking process.

137. *Scraping*.—In Plot XXVIII, 1869, 100 *Officinalis* trees were scraped on the new Java method on 3rd October 1880, yield of bark 246 lb. green and 100 lb. dry; and in Plot V, 1864, 400 trees were scraped during October 1880, yield of bark 856 lb. green and 400 lb. dry. Some of the trees have been mossed over and others left unprotected, but all are renewing their bark satisfactorily, though more rapidly where mossed; and there are no failures whatever as far as I can see.

138. *Number of Trees in Dodabetta Plantation*.—Appendix D is a statement of the number of casualties amongst the trees in the Dodabetta plantation during the last three years and the number of trees now existing based on Major Walker's enumeration.

139. *Receipts and Expenditure*.—I will not add to the bulk of this report by any statements of receipts and expenditure, as these have been given in full in the last annual report just reviewed by Government.

140. *Dried Specimens*.—The following dried and mounted specimens accompany this report:—

Red Barks	Chinchona Succirubra (red bark) ...	From Naduvatam.
	Chinchona sp. Called Magnifolia at Naduvatam and Patà de Gallinazo by Mr. Cross; supposed to be a new species; was collected by Mr. Cross at high altitudes in the red bark region; called also Mr. McIvor's hybrid ...	Several specimens from Naduvatam and Dodabetta from forest soil and from grass land.
	Chinchona. Called Pubescens at Naduvatam and also on Dodabetta, where it is not distinguished from the last, of which it is supposed to be only a slight variety ...	Do.
	Chinchona Officinalis, typical (crown bark) ...	Specimens from Naduvatam and Dodabetta.
	Chinchona Officinalis, var: Uritusinga (called broad-leaved or strong-growing Condaminea) ...	Specimens from Dodabetta.
Crown Barks	Chinchona Officinalis, var: Angustifolia ...	Do.
	Chinchona Officinalis, var: Crispa of Ceylon ...	Do.
	Chinchona Officinalis, var: with very narrow leaf, probably Crispa of Mr. McIvor ...	Do.
	Chinchona Pitayensis ...	Do.
Yellow Barks	Chinchona Calisaya ...	Specimens from Dodabetta and from Naduvatam.
	Chinchona Calisaya, var: Anglica ...	Specimens from Naduvatam.
	Chinchona Calisaya, var: Javanica; so called at Naduvatam, probably "Josephiana," only a bushy shrub ...	Do.
	Chinchona Calisaya Ledgeriana ...	Do.
	Chinchona Micrantha ...	Specimens from Naduvatam and Dodabetta.
Grey Barks	Chinchona Nitida ...	Specimens from Naduvatam.
	Chinchona Peruviana ...	Specimens from Naduvatam.
	Chinchona Pahudiana ...	Specimens from Dodabetta.
	Chinchona. Unknown species with cork like bark; leaves hairy on both surfaces and hairy capsules; supposed by Mr. Cross to be the genuine "Crispa" of Loxa ...	Do.

141. It appears to me important that I should proceed to Darjeeling to see the large Chinchona plantations there, and the different species in cultivation, and take notes on the system of cultivation pursued and other matters which might be of use to the officers in charge of these plantations; so if Government wish it, I shall be prepared to proceed there shortly.