and ferns; and finally several layers of coal
and directly over them the conglomerates.

All these strata are traversed by a vein of
greenstone. The greenstone itself has changed
into a clayey rock, not only where it is visible
in the strata raised above sea-level, but also
on the shore itself. Where it is submerged
by the waves, it is completely fissured and
the surfaces of the fissures are covered with
iron. On the sea-shore it is lined on each side
by bituminous slag. This bituminous slag
is a mixture of the rock and the coal, which
was, as it were, carbonized by the heat. When
we look for the corresponding strata on the
mainland, an explanation seems difficult and
open to argument. Above Moris’s Bath we find
indurated clay on the uppermost coal-seam:
there this clay is also covered by conglomerate;
but there it is above, not under the uppermost
coal-seam. We must therefore accept a fourth
coal-bed, which is nearer to the surface in
addition to the three known ones, or drop that
explanation altogether. Nothing further remains
for us but to accept that the existing coal-seam
corresponds to the lowest coal-seam at Moris’s
Bath and that the clay-strata, which we see
naturally or not at all at Moris’s Bath, were
changed into a thermantide by heat. I prefer the
latter explanation. It is natural to assume that
the strata above the lowermost coal-seam were
broken off by the sea raising such small masses
or rather by the force of this upraising and that
the pudding-stone was deposited on top at a
later stage. (After another visit to Shepherds
Hill, during which I noticed an upper stratum of
coaly clay right underneath the conglomerate, I
now adopt Clarke’s opinion that Nobbys Island
corresponds to the upper part of the series i.e.
the upper conglomerate, the first coaly clay,
and the following sandstone and altered clay
layers (thermantide), analogously found in
Shepherds Hill. 14 October.)

In the coaly clays I found very fine \textit{Equisetum},
ferns, and perhaps \textit{Calamites}. 
*The Indian’s Prayer*

Let me go to my home in the far distant west
To scenes of my childhood in innocence blest
When the tall cedars wave and the bright waters flow
Where my fathers repose. Let me go let me go.

2
Let me go to the spot where the cataract plays
Where oft I have sported in boyhood’s bright days
And greet my poor mother, whose head will overflow
At the sight of her child. Let me go let me go!

3
Let me go to my sire, by whose battle scarred side
I have sported so oft in the morn of my pride
And exulted to conquer the insolent foe
To my father the chief. Let me go, let me go.

4
And oh! Let me go to my flashing eyed maid
Who taught me to love ‘neath the green willow’s shade
Whose heart like the fawns leaps as pure as the snow
To the bosom it loves. Let me go let me go.

5
And Oh let me go to my wild forest home
No more from its life cheering pleasures to roam
Neath the groves of the glen let my ashes lie low
To my home in the woods. Let me go let me go!
Black Hawk Jr.*

10 October

Very vivid old reminiscences crowded in on my mind when, from my bed of ferns in the night in the bark hut of Telligerry, I saw the dancing flames of the fire reflected on the brown walls of bark. I remembered my journey to the valley of the Mescal[?] and our walk through the valley of the Rhine. The narrowness of the room recalled to mind a pretty French post-coach and the images kept playfully dancing up and down, separating from and rejoining each other in manifold ways, just like the flickering reflection of the fire, until the chirping of the crickets and the croaking of the frogs had lulled my tired mind into a deep, unconscious sleep.

At the desolate outer door[?] of ‘Hell’ wild dogs, wallabies, opossums, snakes, and lizards had strangely met together. Their tracks converged on one common centre from all directions, and even the snake had left behind it a wriggling line in the loose sand.

[Letter in German to Wilhelm Kirchner, 14 October 1842. Aurousseau, 1968: 528-533.]

18 October

Last Saturday I made a small journey on foot to a cattle station of Mr Scott at the foot of the Sugar Loaf. This is a very important, clearly defined mountain range striking from north to south, which the map of Buckland* shows as consisting of trap. Since in the proximity of Newcastle I was not able to discover any trace of limestone, I thought it was possible that the mass of eruptive greenstone might have pushed upwards and brought to light deeper lying limestone beds. From Newcastle accompanied by Mr Bolton, a customs officer, who had been so kind as to promise to show me the way, I traversed a sandy plain covered with low scrub and woody plants, which probably owes its origin to the activity of the sea breaking down sandstone rocks. After passing through a coppice of low-growing *Melaleuca*, also containing, apart from the paper-barked white, knobby *Melaleuca* tree, *Callistemon linearifolium* and *marginatus* with magnificent red flower-spikes, we crossed a plain similar to the first one; however, there now appeared dark alluvial soil, which, rising only a little above the level of the

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Darragh and Fensham
Hunter, owed its formation to the latter. Ash Island, Buffalo Island, and a number of other islands in the estuary of the river, are of similar formation. Mr Scott told me that he had drilled his artesian well pipes through 96 feet of alluvial soil without striking the rock strata that occur around Newcastle. He also told me that on Ash Island in dry weather the ground is often covered with white salt, which he believes to be sodium chloride. This is, however, not certain, it could just as well be saltpetre, because I think that a soil so richly saturated with sodium chloride cannot be as fertile as that of Ash Island. {I distinguished fine transparent elongate crystals, which I think belong to the "base rectangulare" (magnesium), and a fine powdery coating, which is probably common salt. In the swamps. October 26.}

We now entered the bush, which vividly reminded me of our native oak and beech forests. There are indeed many points of extraordinary similarity. The casuarinas represent the conifers, the stringy bark the beech, and the spotted gum and the ironbark the oak. While the stringy bark has a smooth bark, similar to that of the Platanus, those of the spotted gum and ironbark are fissured and rough. The timber of the ironbark is used for fences – a very important item for New Holland’s landscape and agriculture, since the fences allow the cattle to be left to themselves without further supervision, thus saving great expenditure on herdsmen. It is of the utmost importance to have a kind of timber that resists the damaging forces of this climate for a long period, and the ironbark (a species of Eucalyptus) has this quality to a high degree. {Melaleuca is also used for fencing, also Corypha australis where it grows. 26th October.} An experienced eye can readily tell by the fissures in the bark whether a tree can be split easily and regularly or not. A suitable tree is cut down and split with wedges in the direction of the medullary rays. Parallel fissures in the bark indicate easy splitting. {Bolton.}

I was delighted. The trees were of enormous girth and height. Many certainly rose to 120 ft including the branches, the trunk being 80 ft. This was particularly the case in Dark Creek, in which the ground was moister.

At the same time a large number of other shrubs occurred, which I had already found on Mitchell’s farm under the same conditions and in the same company. Eudesmia, a strongly smelling labiate, {Prostanthera.} a Cassinia, and in addition several other very beautiful composites. After refreshing ourselves on a dairy-farm with a glass of milk, we crossed the stretch of forest still ahead of us more quickly, reaching Minmy to my pleasant surprise earlier than I had expected, where Mr Scott’s Irish overseer kindly invited us into his timber cottage. The soil, where marshy ground does not indicate connection with the river, rested everywhere on sandstone rocks, from whose decomposed elements and mixture with plant matter ... a moderately ...

The soil consisted of the elements of the ferruginous sandstone, which formed the basement, and a moderate proportion of decomposed vegetable matter. Though it did not look very fertile, it did provide adequate sustenance for a prolific vegetation of trees. Pultenaea villosa, Chorizema, several species of Acacia, the wattle-tree (an Acacia the bark of which contains plenty of tannin), and two/one new leguminous plants form low and medium-sized shrubs. Mr Scott’s station at Minmy consists of larger and smaller tracts of swampy land, of which the ones closest to the dwelling are already being cultivated, and of wooded hills, which for the greater part show the previously mentioned sandy soil. Water is available all the year round, and in the winter-time the low-lying land is usually flooded. Reeds grow everywhere and the curradjong [kurrajong], the bast of which
Acmena ovalifolia, Eudesmia (?) and many other plants, which like moisture thrive well. The formation of the surface is interesting here. The sandhills form an almost perfect basin, which, however, is broken through in the south-east where the basin winds round the end of the curved ridge of sandhills. A deeply cut water-course enters the basin from the south, follows this curve and leaves it through the south-eastern opening. Further upstream there is a coal-bed about 3½ ['] thick. The top part of it is chidder, i.e. a kind of carbonaceous clay; the bottom layer consists of fine solid anthracite.

On Sunday we rode to the foot of the Sugar Loaf. At Cocked Hat clay beds became visible. Mr Scott’s second station, which is now abandoned, comprises an extensive plain sparingly covered with Melaleuca trees. A large number of Doryanthes excelsa, and hundreds of sturdy plants grew by the wayside, particularly on slopes descending towards the moist hollows, often joined by Xanthorrhoea arborea(?), which formed a strange and rather peculiar fence behind Mr Scott’s station. They were often 15 and even 20 ft high. However, we found only one of the giant lilies, as they are called by the settlers, in bloom. They grow a flower stalk sometimes 15 to 18 ft high. At its top the large dark-red flowers, being joined into bracts in twos, formed a rather short cluster, whose circumference often equals that of two human heads. Where there are hundreds of these flower-heads standing together, they must make a truly magnificent impression. Watching everywhere for trap, we arrived at a gully into which the mountain creek had rolled big boulders during the winter rains. Here everything again was sandstone with large quartz grains, similar to that of Sydney and pudding, in which I again found the porphyry of Pt. Stephens in small pebbles. Nodules of iron were equally numerous. Returning to Minmy I was in a sense disappointed, bringing back nothing save a bad sore as a result of my ride.

Life out in the bush is in a certain way very attractive for many a mind. A young man is left to his own devices; his horse, accustomed to life in the bush, is always at hand; his gun gives him despotic power over animate nature. In a bark or timber hut, which may be partitioned into separate rooms, he will enjoy a huge log-fire merrily crackling and blazing in the big fire-place during cold and bad weather. Here he will also enjoy his damper and his tea sweetened with brown sugar, which are never missing at breakfast, lunch, or dinner. Here the young men from the neighbouring stations gather together telling each other funny jokes, which are unfortunately often of a frivolous nature. The night hovers silently above and around him; the moon, with the full clarity of the sky here, casts its magic light over the clouds and the tops of the thinly-leaved Eucalyptus trees. From time to time the deep silence is broken by the screeching call of the opossum, which crawls from its deep tree hollow at nightfall; the owl circles with soft wings around the hut, calling its mates with a broken boo! boo! In the winter-time he is startled at the howling of the wild dog, which is prowling round the fold to carry off an unguarded sheep or calf.

We were disturbed by the constant bellowing of the cows, which had been separated from their calves and were returning from the pasture to the hut and calling for their calves with plaintive bellows. In the morning the herdsman gets up and milks his cows, which he has to catch and then fasten well by the head and feet to be able to milk them easily. This done, he enjoys his breakfast, then gets on his horse and visits the wild wandering cattle. On his return home, he attends to his
business matters, eats his lunch, and then pursues his own inclination; what he does in the evening I already mentioned. Better, profounder minds usually complain about the lack of occupation during free moments. In this regard scientific observation of nature could become the most pleasurable pastime. But unfortunately a liking was seldom directed to these subjects previously, and now instruction is lacking to fill the gap.

Only as much maize and wheat is grown in the bush as is necessary to give the settler sufficient bread. Oats, barley and lucerne are frequently cut and serve as green fodder for the horses and cattle. Only rarely does the settler think of growing vegetables, though these would do so well in this soil. Things are, however, different of course in those settlements where agriculture is the chief industry. The soil can produce plenty; on the Hunter River it is usually rich alluvial soil, which yields rich wheat crops in favourable years. Unfortunately these favourable years are rare, since the lack of rain makes all the trouble of the agriculturist futile. But even this lack of rain could be remedied by artificial ponds and irrigation in connection with them, if only cheap labour were available; but the extraordinarily high wages that have to be paid make any attempt of this kind impossible. It is very disheartening to see such rich properties lying unused, because there is no labour to wrest its treasures from this bountiful nature. On the other hand we see the settlers toiling and moiling for years, living in their miserable huts, without enjoying either physical or intellectual pleasures, always inspired just by the craving to become rich and dispelling any suggestion of nobler pursuits with the reply, “I have no time, I must concentrate on making money.” And when they see somebody pay greater attention to nature, their first and ever repeated question is, “What’s the use of collecting plants and studying nature: what material advantage can be derived from that?” But since man when he has social contact must have something to talk about and at the same time arousing universal interest, he starts to talk scandal about his neighbours as soon as the topic of oxen, horses, &c. is exhausted. Here at Newcastle there are two parties, which almost fight against each other, of which one sides with Mr Scott, and the other with Mr Reed. The one faction probably ridicules the other, and in this way they while away the time as best as they can.

19 October

Yesterday my dear friend, Mr Lynd, came to Newcastle, and today we once again went on one of our joint excursions. We made for the small garden and tillage allotted to the rectory. Behind it there is a shady, moist valley, where there was a large number of plants, particularly ferns growing. We found several interesting plants in flower and which I had previously seen only in foliage, for instance the beautiful climbing Lyonsia straminea. The sandy plain behind the property of the Australian Company is rich in beautiful Myrtaceae. There are Callistemon salignum, marginatum, and linearifolium. Here is Melaleuca virdiflora, lanceolata, armillaris, and juniperoides, various species of Eucalyptus, Fabricia laevigata, Baeckea diffusa, and several species of Leptospermum.

We have again those north-westerlies, which increase and abate with the sun, which I mentioned a fortnight ago. Yesterday and the day before yesterday it was unusually cold. Today, however, it is again very warm.

26 October

Last Friday we went on foot to Ash Island, which is about 11 miles distant from here, accompanied by Mr Scott and Mr Bolton. The road to Maitland, which we followed,
took us through good timber country, which, as mentioned before, vividly reminded me of oak and beech forests of northern Germany in the shape and distribution of the trees. The dry land, elevated above the water-level of the river, is broken from time to time by swamps or moist low-lying parts, which are covered with the swamp *Casuarina, Callistemon* bushes, and various species of *Carex*. These swamps are the best parts of the cattle stations around Newcastle, since they keep the moisture much longer, providing the cattle with good feed and water. When we were approaching Hexham, Mr Bolton shot a landrail (*Crex*). We noticed and collected a new species of *Davallia* on the masses of *Acrostichum*; of which one or several were carried on almost every tree and a new species of *Loranthus*, unknown to us, with sweet pleasant tasting fruits on an *Eucalyptus* tree.

Ash Island is one of the numerous islands in the mouth of the Hunter River. On the one hand these islands have been formed by the finely washed and pulverized clay and sand and particles of humus carried down by the river, and on the other hand by the sands and shells driven up by the tide. These alternating streams are perhaps the very cause of this island building, as the strong water-currents, stopped by an opposing force, now drop the foreign bodies of greater specific gravity floating in them. The western end of the island shows a dark, humus-rich and fertile soil, whereas the south-eastern end consists of bivalve shells and sand. At that end fresh water is found at a depth of 5 ft, whereas in the other parts of the island it is more or less salty (brackish). [The berm?] is frequented by birds.) On the northern side extensive swamps, thickly overgrown with a species of reed, break up the higher parts of the island; some of these swamps are tinged yellow by iron-ochre and may contain pink ironstone. A sharp grass is common everywhere; the cattle seem to like it less, preferring the reed by far. The whole southern part of the island is more fertile by far and its wild nature is much richer. Mr Crummer has laid out a vegetable garden here, and one old man (the deaf man) is sufficient to produce a good crop. From this garden to that of Mr Scott on the western part of the island, a thick scrub of all sorts of trees and plants extends on the banks of the river. The latter are mostly parasitic species of orchids and ferns; the fertile soil is perhaps too shady. However, *Hydrocotyle, Notolaena, Pteris*, and a number of other plants grow here.

Among the conspicuous trees and plants are the *Corypha australis, Acrostichum alcicorne*, a most interesting *Ophioglossum* (The *Ophioglossum*, like the *Davallia*, grows in the half decomposed seed-leaves of the *Acrostichum*.), *Capparis*, the parasitic fig-tree, *Lyonsia straminea*, the Australian vine, the Australian apple, *Ripogonum*, the nettle-tree, which, however, I have seen nowhere for certain except for a young specimen. A beautiful *Croton*? is common; a fairly big tree with red berries, probably belonging to the celastrines, the native plum, which seems to me to be a *Myrsine* (but is not a *Myrsine*).

Although a long-lasting drought and north-westerly winds have done very great harm to the vegetation on the banks of the Hunter River, the garden plants on Ash Island are fresh and vigorous. The orange-trees, of which Mr Scott has about 1200, delight the eye with the deepest and freshest green, and the vine pushes out extraordinarily luxuriant shoots. This is probably due to the clayey subsoil, which retains the moisture for a long time, only gradually yielding it to the top part. *Coccus hesperidum* is extremely troublesome. I poured a solution of copper sulphate on one tree and a strong solution of common salt on another in order to cauterize this insect. The latter usually causes the fall of the leaves, but the new foliage is free of the pest.
In the evening, shortly after sunset, a grating noise in the orange-trees aroused our attention and curiosity. At first we thought it was produced by a frog, therefore we were not a little surprised to find a cicada inflated like a bladder. At the hindmost ring of its thorax it had a kind of drum on both sides, the structure of which I shall examine at the next opportunity. After one or two hours of uninterrupted grating, it became more broken, and it was answered by a less loud but similar call, probably that of an approaching female. Shortly after they were silent for the rest of the night. Apart from this grass-green cicada, which even the sharpest eye could hardly distinguish from the surrounding mass of leaves, the silence of the evening was animated by two other crickets. A large owl frightened friend Lynd. Mr Scott tried in vain to shoot it.

The lizards, which go hunting insects among the low grass, are dark and resemble the tilled land, but they seem not to be specifically different from the small *Lacerta* in the Government Garden in Sydney. Black snakes are common, but I have not seen any. They escape quickly as soon as they hear footsteps, and you are perfectly safe if you beat the grass in front of you with a long stick.

When I came to Newcastle facing, after a long time, a more rustic kind of life, my mind was vividly preoccupied with the images of former times, with reminiscences of former happiness, and I was seized with the desire to settle here and try my luck. I had sanguine hopes and I was confident of achieving great things. But as I became gradually more acquainted with the circumstances, I saw that the social conditions were deplorable, that envy, jealousy, and hard-heartedness did not allow one to think of a friendly community life, and that the most persevering industry would not suffice to gain a comfortable independence, because of the lack of labour and the high cost of wages. This cooled me down considerably. On the other hand the progress, which I made in the knowledge of nature, stimulated me exceedingly to more extensive endeavours. I wished to extend my journeys and to see other parts of the colony, so I resolved then to use the money, which I had in the savings-bank for scientific purposes and to earn my daily bread otherwise only if compelled by necessity. This morning I saw a horse, which seems well suited to me and which I shall probably buy. The owner is a young man, who came out with me from England. I did not recognise him at first, but later he told me that he had travelled as a steerage passenger because of his poverty. His name is Calvert. His brother-in-law owns some land here, but he went bankrupt and his property is unfortunately of little value.

On the south-eastern end of Ash Island, which is surrounded by salt-water, and which has no natural springs, Mr Scott had caused a 6 ft deep pit to be dug in which a little fresh water collects. Hornets and wasps flew from all directions to this fresh-water pit, and little birds were not deterred even by our presence from flying into the pit in order to quench their thirst.

On our return to Ash Island, we called at Mr Crummer’s garden at Cobham. The old deaf gardener was sitting before his timber hut, carefully cleaning the dirt from a wound on his finger. He had not noticed our arrival, and we five grown-up people stood around him watching what he was doing as attentively as he was watching his hurt finger. Finally I knocked my stick against the bench. He looked up at us, quite astonished for a moment; then recognizing Mr Scott he touched his straw-hat in salutation and invited us to sit down on his bench.

I have just returned from the north bank, where the ripe white berries of *Leucopogon richei* refreshed me and the beautiful flowers of the *Ipomoea* delighted me. The plant climbs up low trees and then spreads all over them. Numerous splendid violet flowers cover the green intertwined bush, which so adorned creates an agreeable impression all the more considering it appears here on sandy soil and among a poor vegetation. Where *Pteris esculenta* and *Melaleuca viridiflora* (?)/*juniperoides* with its membranous bark grow, there is usually little to be had.

It was interesting to observe the shoots sprouting forth from the young wood around the perimeter on the remaining trunk of a felled *Casuarina*. They do not come from the medulla, or from the medullary rays, as far as I could see.

Suddenly I was startled by an iguana running away. A little later when I stopped at an open place, it came forth from under the bushes, but as soon as it saw me, it stopped and when I moved my head slightly, it quickly ran away terrified. It might be 6-7’ long.

The diversity of the ants astonishes me more every day. If I were more skilled in the art of drawing, I would prepare a monograph of the Australian ants. Today I found three different families together on the same tree trunk. Very small black ones in company with very large ones. A small green metallic species seems to sting.

Besides a *Hieracium* (?) and an *Epilobium*, the petals of which were rounded, I found an unknown tree with ternate flowers.

Under the bark of a *Melaleuca* I caught two brown beetles with long comb-like antennae, which when caught, not only gave a strange sound, but also excreted a yellow liquid, which had a peculiar smell.


23rd November 1842

My dearest William. (It is not urgent enough for a letter).

Yesterday I safely arrived back at Newcastle from a walking-trip to Lake Macquarie and to Brisbane Water. People had raised many objections against the undertaking: the heat, the lack of water, the distance between the isolated settlers, and the poor accommodation for the night, which is found everywhere. Moreover a man, who was commissioned by the government to collect the quitrents accompanied me. Such a man is never liked by the colonists, my friends said, and I would be made to feel that too. But all this did not put me off, and at 5a.m., on the 14th November, we left Newcastle on foot in a cheerful mood. My companion was a fat man, who wanted to walk himself a little slimmer; he was the postmaster of Newcastle, auctioneer, and commissioner. He was experienced, well-travelled, communicative and of ever cheerful disposition. I had given him to understand that he would have to put up with my scientific objectives a little, although I anticipated that they would bore him after a while. He showed, however, enough scientific curiosity that I generally appreciated him very much for that. As we were walking along the lightly wooded track behind the buildings of the Coal Company, we sighted a wallaby, which was browsing on the grass while hopping along, but when it noticed us, it flew away in long bounds. *Melaleuca thymifolia*, with its violet flowers, was in full bloom, and the air was filled with the perfume of honey from a *Leptospermum* with a shaggy calyx. The *Melaleuca* and *Leptospermum*, and the *Calothamnus* have a very pleasant sweet smell in general, while
other plants lack it, as I noticed repeatedly. ["Leptospermum", with broad ovate leaves, oblong, blunt, mucronate or not, 6″ long, 4″ broad, a little tree, bark separating in long ragged strips or bands.]

The clear whistling of the bellbird indicated that we were in the vicinity of water. Many times during our often exhausting travels, it cheered us up by its simple call. The birds here have much more varied calls than in the vicinity of Sydney, they enliven the forest. The singing of one of them is very much like that of the finch. The laughing jackass amused us with its loud gobbling, teasing call. The cattle station, which Mr Fenwick holds, has plenty of water and in the few lean years is rich in fodder, but at present the poor beasts are so emaciated owing to the poor pasture that they can hardly give milk. In the oppressive heat of the day, they rush into the swamps to quench their thirst in the remaining pools. In doing so, they sink up to their bellies and, as they are unable to get out of the mud again, either starve or perish of thirst, unless they are eaten alive by the wild dogs, for the latter, prowling about the herds by day and night, soon notice where strength for defence is wanting and form into packs up to six and chase the weakest cattle or calves into the water and then pounce upon the floating animal until, exhausted by the loss of blood, it finally falls as their prey.

We now walked, always along the high ridges, from both sides of which valleys and gullies descended on one side to the Hunter River and on the other to the sea. I earlier described their indented and basin-like shape, which seems to have originated from water during violent downpours. The ridges from Newcastle to the Lake are almost without exception covered with conglomerates. The same conglomerate is found on the other side of the lake up to Newport and almost as far as Brisbane Water where the sandstone, corresponding to that of Sydney, becomes, however, more general and supplies very good building-stone at West Gosford. On our mountain track, where we saw ourselves constantly surrounded by bush, Eucalyptus and Casuarina and low brushwood of Pultenaea, Daviesia and Chorizema, a sapling of the white cedar, which normally prefers moist, fertile ground, surprised me. Zamia grows in abundance everywhere. I was delighted to see Blandfordia grandiflora with its beautiful, large, hanging, red funnel-shaped flowers here on this sandy soil among shrubs of Leptospermum. Lambertia also occurs here and Persoonia falcata is very common.

Shortly before our arrival at the lake, I noticed coarse-grained sandstone, which to all appearances is of limited extent. It is possible that this sandstone corresponds to that below the first coal-bed. The lake itself is surrounded on its western side by a zone of peculiar fresh vegetation – all of it trees and shrubs, which I have not yet classified. I must mention here a Persoonia with lanceolate-linear leaves and slightly compressed fruits, which seem to indicate a different species.

Mrs Brooks received us with great hospitality. She treated us to plenty of milk, killed a turkey, and served us home-made ham, whose excellent quality they could both be rightly proud of. The meat is first salted and peppered and remains in brine for some time, then hung up in the chimney for smoking.

Mr Brooks showed me his coal-bed on the shore of the lake. The site and position of the rock corresponds exactly to those at the entrance to the Valley of Palms and at the entrance to Lake Macquarie (South Head). The coal rests on a broken, blue, clayey sandstone or sandy clay, and consists of a lower 2½′ thick seam of anthracite, which is separated from the upper useless carbonaceous clays by a 2″ thick bed of white clay. On top of these there are fritted sandstone and clay deposits. Among the coal
are many impressions of leaves, which are not different from those of the second bed at South Head.

The garden is well kept, and the fruit-trees are doing very well. The wine would be richer, if Mr Brooks had not left too much wood on the vine. On the jasmine foliage I saw the first *Cistus laburnum* in the colony. His peach and almond trees also have little fruit. He told me that one of his young trees, which stood in full bloom in the morning, had withered by night-time as a result of the burning sun. It should be mentioned that a loquat tree, which he planted at the same spot had also withered.

Mr Brooks told us that during the rainy season a chalybeate spring comes from underneath the conglomerate almost at the water-level of the lake. The native plum had strewn its beautiful large plum-like fruits over the ground. Mr Brooks told us that the savages bury them in the ground for three days and then suck out the juice, without swallowing the coarse parts, because these cause abdominal pains. I did, however, eat the fruit and the probable result was that I suffered from a violent stomach-ache on the following day. I also want to make mention of two beautiful strong dogs, owned by Mr B. which were very savage and frightened even their own master.

After a distressing night, during which the bugs did not give me a minute’s sleep, we waded through the lake at a spot where many flat islands rose just above its surface. We saw a fish, which had been hidden in the mud and, as it heard us, speedily shot away, churning up the mud. A Pittosporum and a Plumbago (if I am not mistaken) were found on the Brooks’ side of the lake.

We lost the track, picked it up and lost it again, and after an arduous journey in the oppressive heat of the sun reached Mr Threlkeld’s property, where I was most cordially welcomed by my old acquaintances, Mr Davies and his children. We killed a black snake, which had been pretty close to Mr Flood and had probably not been roused by our footfall. On a Eucalyptus tree, in a cavity formerly the base of a branch, which had broken off and rotted away, I found a beautiful unknown orchid with long grass-like, ribbon-shaped leaves and hanging flower-spikes. (“The leaves were 2’ and more long, 4″ broad, acute, sheathing at the base, distich, flowers in racemi of about 9” long with a fine spicily honey flavour, of greenish colour. (Ochroleucon) the upper lip cut in; the labellum oblong blunt articulate. The Center purple coloured. Anthers thermal, the pollen one simple[?] 2 lobed. *Cymbidium suave*?”)

*Lambertia* was the only plant, which refreshed us with its rich honey. The Australian countryside is too poor indeed in nutritious tasty plant products. The few, which are edible, give only little satisfaction. On a water-pool, about 2 to 3 miles before Threlkeld’s, *Callicomis* was in bloom, a beautiful legume (perhaps a *Gompholobium*), a narrow-leaved *Leptospermum*. *Calothamnus* seemed to have a different leaf here. The *Doryanthes excelsa* and another species of *Xanthorrhoea* with a very short flower spike grew in large numbers everywhere. Old Davies took me to the shore of the lake, where I found conglomerates outcropping, alternating with fine-grained sand. The conglomerate contained pebbles of porphyry, trap, and another volcanic rock, and indurated clays. An efflorescence
The Leichhardt diaries. Early travels in Australia during 1842–1844

was seen mainly on the sand, which Clarke regarded as saltpetre; which to us, however, seemed to taste more of magnesia. [The porphyries contained crystals, which seem to be feldspar. The decomposed material seems to be identical with the efflorescence!] We now went to Mr Threlkeld’s coal-pits, where we found the coal directly under the conglomerate, and separated from it only by a thin clay-seam. The top chitters are just a brownish clay, impregnated with vegetable matter, which does not burn. The lower ones are a thick bed of matt coal, which is worked out in large lumps. This coal burns very well, leaving only fine, white ashes but no caked lumps. [We did not find any impressions of leaves here.] Mr Threlkeld is about to sink a new shaft in order to strike a second coal-bed. He has already bored through 36′ of bluish masses of pudding-stone. I am very doubtful whether he will find more coal below this. I had not yet seen the coast south of Lake Macquarie and therefore judged only according to the observations, which I had made at Newcastle. There the blue conglomerate appears on the coast below South Head and below the gaol and seems to have its place under the 3rd coal-bed. The workmen told me, however, that similar conglomerates are found under each coal-seam. This will no doubt be correct, since conglomerates can take the place of clayey sandstone anywhere. The conditions of the coast at Newcastle therefore do not give sure information about the coal-beds of Lake Macquarie. However, as we go further south, we see that the upper yellow ferruginous conglomerates gradually become thicker and thicker and that beneath the coal underlying them a rock appears again, which consists of large rounded boulders. Opposite Birds Island (Wabury Head?) these two pudding beds are contiguous or are separated only by a thin layer of plastic clay, which is of a brown colour in its upper parts and probably represents the coal, which gradually becomes thicker towards the north, until it appears in greater thickness about 12 miles to the north between two conglomerates, which both correspond to those in Threlkeld’s coal-pits. The upper conglomerate accompanies us far to the south, but about Brisbane Water it seems to make way for coarse-grained sandstone, which looks exactly like the Sydney sandstone. If we could properly reconcile these observations with one another, it might lead to a proof that the coal perhaps belongs to a confined basin and that the upper bed, which is insignificant in the neighbourhood of Newcastle, develops to significant proportions around Lake Macquarie, while the three lower ones disappear completely, making way for a blue conglomerate or pudding; and that these are also local formations insofar as coarse-grained sandstone takes their place 50 miles further on. But as it stands there are difficulties in interpretation, which cannot be put aside at the moment. These difficulties reduce to four points in the main: Nobbys Island, Little Red Head, William Brooks’ coal-pits, and South Head of Lake Macquarie. In all these places we find a bed of anthracite at the base, at sea-level or approximately so. Above it appear fritted sandstone and clay hardened by volcanism. There is not a trace of conglomerate in their proximity. They usually lie on blue clays or clayey sandstone. I have always identified this anthracite with the second coal-stratum of the coastal sections, and the altered rocks correspond quite well to the clays and sands resting on top of that bed. But I cannot explain how the coal-bed of those localities and its position in relationship to the sea do really correspond to the 4th coal-bed, and why Threlkeld’s matt coal and Brooks’ anthracite and that of South Head are, as it were, found mixed with one another at the same level on Lake Macquarie. Nor that Threlkeld’s upper coal is seen beneath conglomerates at South Head, Lake Macquarie, and that there is
not the blue conglomerate in Threlkeld’s pit under it, but indurated clay and sandstone. Since the distances are so small and the strata lie almost horizontal, it is very difficult to explain such a mixture and diversity of rocks. Perhaps an ideal section would better express my thoughts.

On comparing Nobbys Island, Little Red Head and South Head of Lake Macquarie, our attention is drawn to another fact. We find that these localities are bounded towards the north or north-east by flat sandy sea-shores. The mouth of the Hunter River separates Nobbys Island from the flat sandy north-shore and the long beach, which extends as far as Pt. Stephens. There is a similar mass of sand between the mouth of Lake Macquarie and Great Red Head, and Little Red Head is surrounded by sand in the direction of the lagoon and the north-east. Where do these sands come from? They have no resemblance to sandstone in the vicinity of Newcastle, but are reminiscent of decomposed Sydney sandstone. Should one assume, then, that the sandstone around Sydney was deep down in those localities and that its comminuted fragments were thrown on to the shore by the play of the waves? This would quite agree with my theory that the Newcastle coal and the Sydney sandstone are contemporaneous formations, which owe their difference in character to the difference of the localities.

Old Davies had much to tell me about his own affairs and about our former fellow-passengers on the boat. Afterwards he explained to me the art of making cheese and showed me the moulds, in which the cheese is pressed. After the milk has been made to curdle with rennet, the remaining whey is pressed out in a press. The cheese is dried by rubbing it with salt and cleaned daily, probably to keep the flies off. I think the Australian cheese, which in any case is not as rich as the English or Swiss cheeses, would lose its somewhat flat taste if a mixture of herbs were added. Since there are many bitter, strong-smelling herbs in this country, it is only a question of making the right selection. I can hardly hope to gather good experience in this matter.
On November, 16th, we left our friendly host, and tramped along the little used bush track to Newport or Stingy Ray Point. The conglomerate and later on sandstone cropped out on our way. After losing the track at a waterhole, we followed the compass across the bush. *Lomatia* grew abundantly here. *Lobelia gibbosa*, which I had already found in the vicinity of Newcastle, and *Xanthorrhoea* grew in rich abundance, a sure indication of sandy, infertile soil. A probable new species of *Persoonia* with leaves arranged horizontally and flowers in axial clusters, 1 to 2’ tall. In all the tall *Eucalyptus* a large number of cicadas were singing their shrill or rasping song. As soon as one started, the whole chorus joined in and they all fell silent at the same moment. This is the very season of their resurrection. The larva lives in the moist soil throughout the winter. At the beginning of November it climbs from its funnel-shaped hole, secures itself with its sharp claws to the lower part of the tree-trunk or on stakes, waiting here for its metamorphosis, which takes place by the skin of the larva bursting along the centre-line of the back. The complete cicada now crawls up the tree, and soon joins in the song of its mates. At first I thought they were not very agile, but later I frequently saw them flitting about, and many came and sat on my straw hat.

After we had been worrying a long time at the thought of being lost in the bush, we discovered to our great joy the ruts made by a two-wheeled cart, which we followed and which brought us to a cleared cultivated field with some four or five small bush huts standing around. The inhabitants gave us the necessary information about our way, and supplied us with water and tea, which we enjoyed with great satisfaction. The teapot in a bush hut is hardly ever taken off the fire. Very rarely does one remove the boiled-out tea-leaves, while fresh ones are continually being added. In this way the astringent principle of the tea is given to the usually bad water, while the excitant one is very slight and does not harm the stomach. Moreover the tea is sweetened with brown sugar, which also diminishes its property; and milk or fresh eggs are also added. Tea with a fresh egg in it is a very pleasant drink and quenches the thirst better than any other drink that I know. The quantity of tea and sugar, which is consumed in the bush is considerable, and I think no other region of the world consumes as much proportionally as this colony.

The usual meal is damper, i.e. flour and water kneaded together and baked in hot ashes. The poor colonists around Newport had only damper made of Indian corn (*Zea mays*), but it was offered to our hungry stomachs so hospitably that we valiantly devoured them. These colonists have leased small tracts of land from Mr Holden, and conditions for them will be considerably improved if Newport should really become a town one day, which seems to me rather certain because of its good position. Mr Holden owns the land. He divided it up into one-acre and half-acre allotments, which were then duly announced in all the journals by the best auctioneers. There were, however, not so many buyers as had been expected, although a schoolmaster and a clergyman were sent to the place in order to make it as attractive as possible. A public house, which is usually the centre point of larger settlements, was also immediately provided for. The land is only suitable if it is well cultivated; without good cultivation it will soon be exhausted and it suffers much from drought-conditions. (It is a mild black soil with lots of mussel shells. It would be very suited for viticulture. Indian corn, potatoes, pumpkins, and vegetable marrow do very well in Carter’s garden; cabbage not so well.)

It is a peculiar feeling to find oneself in a town right in the middle of a virgin forest.
streets have their names, public buildings, and churches and markets their sites, yet the traveler is in danger of getting lost in this town laid down on the map!

With the choice of ground that you intend to cultivate in this district, you have to consider its position. If the place is very much exposed to southerly or south-easterly winds, one must fear winter-frost, which kill the vegetation with the quick change in temperature.

North-westerly winds are no less detrimental, because of their desiccating nature. In both cases you must, if there is no other choice, leave tracts of bush standing, in order to mitigate the damaging effect of the winds.

Mr Carter, who like so many other young men brought money to Australia only to lose it, lives in a humble cottage together with his very well educated wife. I pitied the poor creature, who had certainly been brought up to a better life of greater comfort. Though she had probably very strictly observed order and propriety while in England, these refined sentiments of a rich society slackened in the bush; she became lazy and careless, and went without stockings. This is the usual fate of young ladies of her class. Low-class women, who have gradually worked their way up and gained wealth, showed me the opposite tendency: they think highly of white linen, clean clothes, and neatness.

The cork-tree, which grows on the lake-shore, is a Myoporum. A herbaceous Hibiscus (?) grew in the garden, also an Epilobium with emarginate petals, and Erythraea, and a Geranium.

Mr Dodd, the schoolmaster sent to Newport, complained bitterly about his position. He had been promised every convenience and when he arrived at Newport, nobody wanted to accommodate him, so that he was obliged to take up his abode at the public house. He hopes that he will have about 40 pupils from the district.

Mr Rogers, the clergyman of Brisbane Water, comes along every six weeks to preach to the leaseholders and colonists around Newport. The divine service took place at the public house, and both prayer and sermon were really very good. But only two women and two men, besides ourselves, had come to listen to his sermon. This is all the more surprising, since it is usually the married women, who live out in the bush that complain of the lack of divine service.

Newport lies on the south-western end of Lake Macquarie, the circumference of which is 350 miles, including all its bays and the peninsulas jutting out into it. The scenery is not grandiose, but attractive and were its hills covered with vines, instead of with the dull, characterless native bush, it would perhaps by far surpass the much praised Lake of Zurich thanks to the diversity of its bays and the constant variation of its views. The soil around the lake is very poor; the conglomerate forms an insufficient, shallow foothold for the roots of the trees, and it is amazing to see how the big trees, in spite of storms, are held to the ground by a small number of flat, interlaced roots.

On the 17th November we left Newport, which lies on a wide shallow (hardly 2 ft deep) lagoon or bay of Lake Macquarie. Some of the views, for example that from Mitchell’s Inn, are very romantic. A channel filled with salt-water extends far to the south-west. We crossed it and found ourselves on an extensive low-lying plain with good soil, on which the government intends to survey and sell small leasehold-estates. The position seems to me very suitable. There is no lack of water, i.e. fresh water is found at a depth of about 6 to 8 feet. The cows are in good condition. But though this country gives the cattle sufficient feed to keep them in a good external condition, the feed is not rich enough to fatten them. This leads us to the difference between the wild animals,
for instance in Germany, and stall-fed farm animals. The former are rarely fat, or only at certain times of the year. I was told, however, that the pastures on the upper Hunter are much richer and that the butcher can easily distinguish cattle from there and from here.

From the plain we climbed up the hilly ridges in the oppressive heat of the sun, which was not alleviated by any breeze. All the hills seemed to consist of conglomerate, since the path was covered with ferruginous boulders. The small *Xanthorrhoea* grew everywhere and scattered *Eucalyptus* trees, small casuarinas; *Comesperma ericafolia* was in flower, *Scaevola pubescens* (?) very common, *Goodenia bellidifolia* in low-lying spots; a pale-green leafless legume. *Lambertia*, truly a traveller’s delight with its honey-flowers. The first *Grevillea sericea* that I have seen since I left Sydney.

A boy, whom we met, showed us a female possum that he had killed, whose two young ones had escaped. The pouch was very wide; two suppurating glands were full of blood and developed. The teats were very long and both on the left side, so that it seems quite fortuitous, which teat the young ones in the pouch will choose. Towards Tuggerah Beach Creek, the trees became taller and taller and they were often 12 to 18 feet in circumference. But here again we noticed the small number and weakness of the roots.

Several green elaterids were caught on a *Xanthorrhoea bracteata*. At night-time we were delighted by thousands of fire beetles, which flitted like bright stars, everywhere through the dark shrubs, moving up and down, one of the most delightful phenomena I have seen on my trip. The silence of night and the mildness of the air put me in a state of comfort and passive enjoyment, in which impressions of this kind wonderfully stimulate the imagination, lifting it up to fairy realms and enchanted palaces.

I had promised the clergyman to put a branch of *Callicoma*, which always likes the proximity of water, on the track for him, so that he would know the tree. But whenever I searched the next water holes, *Callicoma* was no longer to be found. Instead I found a very similar tree in bloom with serrated leaves, petals lacerated, and anthers opening in pores, which are certainly the characteristic features of *Elaeocarpus*. Another tree budding, with broad glossy leaves placed opposite each other.

We had knocked at two houses for a shelter for the night, but in vain: in neither of them was the master of the house at home, and the women were afraid of accommodating two strangers. The inhabitant of one cottage had just been threatened with court-action, and his wife saw in us two bailiffs, who had come to carry out the order.

As we were enjoying our tea in the still night, we heard one of those huge trees crashing down, probably as a result of a bushfire. At first a tremendous crack, a thunderclap, then the crackling and cracking of the breaking branches.

When you tramp for days on end through the bush of New Holland, you will get rather tired of its monotony. The same trees, the same shrubs surround us all the time, and although we are walking across hilly terrain, the hills are never high enough to grant long vistas across valleys, gullies, lakes, and meadows, which actually do not exist[?]. The forest is like the sea; its silence and its solitude are most impressive at first, but after a length of time they tire the mind, and it yearns for refreshing variety.

Where water is found in narrow valleys, the vegetation usually changes and other genera of trees, with a darker green, occur, crowding more closely together. Neighbouring trees are tied together by creepers, which spread their rich assortment of flowers all over the
tree-tops that carry them. Parasitic plants, *Acrostichum*, *Asplenium*, and species of orchids find adequate nourishment on the moist trunks and even more so in the moist atmosphere.

18 November

A poor cowherd on Mr Healey’s [Hely] cattle station had put us up for the night, and we gratefully departed from his hut on 18 November. On the brackish water, which is connected with Lake Tuggerrah, I found a fine-leaved, green-flowered shrub, which seems to belong to the Celastraceae. *Hibiscus* was in beautiful full bloom. This tree grows in the vicinity of salt-water and fresh-water pools.

On Mrs Sidebottom’s Sunday table there was, besides some mussels, the shell of a freshwater tortoise. The colour of the carapace was black, that of the plastron yellow, each plate lined in black. 25 lateral plates – four – four lateral dorsal plates, five median dorsal plates, two shoulder plates, three breast plates. The sternum had the following shape: The shell is about 5/4” deep.

About 2 miles distance from Sidebottom’s in the pleasant valley not far away from the foot of the Jangeganga, lie eight huge sandstone boulders on the slope of the hillside, regularly cleft by earth-tremors and pushed down the slope a little. They show the features of the Sydney sandstone. The Jangeganga itself is a sandstone mountain; its top is strewn with more or less rounded blocks. At its southern foot commences a rich valley with *Seaforthia* trees, with tree-like ferns and extraordinarily tall, huge *Eucalyptus*. A species of tree with fissured bark was called mahogany-tree. I think it is a eucalypt, but I don’t know which it is.

This is the longest stretch of such rich and beautiful country I have seen in this colony. On black marshy soil there grew fern-trees, seaforthias, white cedars, stringy bark, (?mahogany), *Asplenium nidus*, *Acrostichum alcicorne*, *Polypodium*, and a large number of beautiful unknown trees, some of which were in flower. One was about 50’ high up to where the branches began, a dense bark and wood, with broad elliptic lanceolate leaves (three in the whorl). I very frequently noticed
a small tree with smooth lanceolate leaves, seven veins, and purple berries in small clusters of a somewhat sharp taste. \textit{(Anona.)}

In another gully I found a good example of a fig-tree, which had clasped and eventually choked another tree. I particularly noticed the way in which it had wound round the lower trunk and the root part like a garment.

The raspberry shrubs were full of red raspberries. They did not taste good. They are dry and at the same time have a caprid taste. Mr Flood found that they gave him indigestion.

After crossing one of the most fertile districts, which may perhaps still have to wait a long time for the farmer’s hand, we arrived at one of Mrs Healey’s properties which is being managed by a certain Mr Spencer. He and his wife received us with great hospitality, and showed us the orchard, in which approximately 900 orange-trees did relatively well. \textit{(The trees have no scab.)} The soil is sandy and the orchard extends from two hills down into a valley, in which flows a scanty rivulet. The orange-trees in the valley were green; those on the hill-side had suffered much from the drought. Peaches, apples, pears, and loquats were doing very well. Mr Spencer trained the grape vine in low shrubs and believes that this form is best suited for the vine in this colony. Those stems, which he trained on trellises, were much poorer, suffering more from the drought. This year’s shoots were small, there were many grapes but small. Muscatel thrives best.

He showed us a species of silver-pine from the Cape of Good Hope that grew beautifully and imparted a characteristic view.

Mrs Spencer showed us an oak, which bore some resemblance to \textit{Ilex flaminata}.

At last we got to West Gosford on the banks of Brisbane Water, at present a still wretchedly built township. It was surveyed and laid out by the government, whereas East Gosford, about two miles to the east, had been the private property of a certain Samuel Peake, who made much money by selling the allotments. However, he partly lost it again as a result of fraudulent practices and ensuing lawsuits. East Gosford is extremely romantically situated. A wide extremely indented water-basin, and some significant hills opposite join together to give this countryside an unusual natural gracefulness. The soil, if cultivated, can bear any crop. It has been argued that a rich hinterland, which could use Gosford as the port for its produce, is lacking for the progress of the town. This is perhaps right. I am only speaking of the personal and immediate satisfaction of a dense population, which is not to carry on commerce and export-trade, but to live happily on limited tracts of land cultivated by themselves and content with what they grow for themselves.

“Brisbane Water is a deep bay of Broken Bay, surrounded by significant hilly ridges which, however, do not show any geological sections, but are rounded and covered with vegetation. There are often flat marshy lands in front of the mountains, and deep channels (creeks) penetrate as far as 5 to 6 miles inland. The swamps around Brisbane Water are covered with exceedingly rich vegetation and cultivation would certainly be amply rewarded, once communication has been established to market the produce at low cost. At present there are only shingle-splitters, who use the swamp oak \textit{(Casuarina)} and the blue gum, in the extensive woodlands around Brisbane Water. In the present unfavourable conditions of the colony, people have little money and everyone is complaining”.
The rocks, which can be seen on the shore at Gosford, are 1) sandstone, formed from coarse grains of quartz, but hard and good for building purposes. The clergyman’s house is a fine building and the natural colour of the stone gives a pleasing impression, 2) pudding stone, 3) sandstone and sandy clay containing many mica flakes. In the first-mentioned sandstone there are some impressions, the nature of which, however, cannot be ascertained.

We negotiated with a family of Blacks to accompany us to Newcastle. They did not want to leave before the following Sunday and we resigned ourselves to their whim. From all I could understand, they did not dare to leave that day because the moon rose too late to light them their way to the stopping-places. They did not refrain from asking us for wine, and after we had given them a bottle, we actually had the satisfaction of being let down by them on Sunday. The family consisted of five persons; the man called Aemiable, his gin Maria, a vigorous clever woman, who spoke English well, her brother, a well-built young man with easy, natural movements, a child, and an old man. The following day another family came. The public houses are the greatest attraction for them. Like guests they walk around and hang around the doors, until a kindly soul gives them a glass. They are extremely lazy and only brandy and hunger rouse them from their lethargy. They crouch round the fire or warm themselves in the sunshine, lying on their stomachs, with sprawling legs, or lazily lounge about. Indeed a sad pity for the man who is looking for labour! I heard that they are usually quick and persevering walkers, who easily follow a horseman.

20 November

After allowing ourselves a day’s rest on the 19th November, we returned to Newcastle again by another track. I must, however, mention here that in East Gosford I made the acquaintance of George Prince, the schoolmaster, whose wife showed me ‘the native lady and gentleman’ (a kind of mantis) and gave me many different cicadas, which probably live on different trees. Should a scientific society gradually spread throughout this colony with my assistance, I shall again turn to him to interest him in further collections and observations.

As early as our last day’s journey to Gosford, we had noticed the conical clay hills built by the white termite. Today we found them again, often only 1,000 paces away from each other, on a fertile soil, usually built on a fallen tree trunk, 3’ in diameter, 5’ high; the outer cover consisting of 3” of yellow clay, in the interior a mixture of somewhat kneaded anastomosing rounded branches of brown colour.

As we crossed Tuggerah Beach Creek on our way to Tuggerah Beach Lake, we saw, apart from a large number of seafortias, beautiful, up to 18 ft tall tree-ferns, perhaps even more picturesque and more pleasant than the Seaforthia or Corypha. On a lagoon there was a thicket of low, stunted Melaleuca trees, which were all bent inland by the prevailing southeast wind.

In a swamp 3 miles from Foster’s dwelling there was Blandfordia grandiflora, Xyris, Caustis and Callistemon in full bloom.

Here green groves of apple eucalypts (Angophora) and big Melaleuca trees alternated with wide, open turf-covered pasture lands. Foster’s house itself stands on the neck of land between Tuggerah Beach Lake and the sea.

Here we refreshed ourselves with milk and tea and damper, then waded through the
lake entrance, which will probably soon silt up completely unless human wit prevents it in time, and walked along the sandy coast at low-tide.

The next rocky headland was Bungarah Norah; pudding-stone jutting far out into the sea intersected by joints, which strike from east-north-east to west-south-west, big rounded boulders. On top of this bluish pudding-stone there is the red conglomerate; there seems to be no coal at all here. At the next headland is a bed of plastic clay, with upper brown layers between the two conglomerates. This clay-bed becomes hard near the dyke.

The dyke strikes from south-west to north-east and reappears in the several headlands following. A narrow crevice runs parallel to it. Gradually, as you go north along the sea-shore, the yellow or red upper conglomerate becomes thicker and thicker and so does the lower bluish one. Both become more homogeneous and contain fewer boulders (this, however, changes considerably at every step). Where you first catch sight of Birds Island, you see peculiarly corroded and oddly shaped, torn-off rocks. The upper rocks are reddish and seem to contain much iron. A spring of good water, but with deposits of iron-ochre.

Our strength being so little exhausted and the sandy sea-shore being so firm, we walked rapidly on. Not knowing our distance from Lake Macquarie, we even conceived the ambitious plan of walking by moonlight on to Newcastle during the night. In the meantime the tide began to rise, driving us higher up from the firm sand, so that our feet sank into the lighter ground and our strength diminished more quickly. Eventually we walked around a long, long shore-line, and we found ourselves opposite Birds Island. The sun had set, Venus and Jupiter were shining brightly, but the night was so dark that we could no longer distinguish the rocks ahead from the forest. My companion still wanted to carry on, as he thought he would only have to walk round the next headland in order to reach the entrance to Lake Macquarie. I told him that I was irrevocably resolved to stay where we were and spend the night here, and he gave in. I lit a fire on the bare hard rock, feeding it with dry sea-weed till the big pieces of timber from shipwrecks began to blaze up, giving us a good big fire. We lay down to rest beside the fire, the black masses of rock above us, the sea roaring wildly, the bright star-lit sky, in which the moon rose two hours later. It was a glorious night, the first that I ever spent out in the open. The sea-breeze was very gentle, but by and by the wind turned more to the south and became cooler. I alternately warmed the one side of my body, then the other, sleeping quite well, considering the hard stone bed.

Our stomachs were empty and early the next morning we pushed forward to the tea-pots of Lake Macquarie. But how disappointed was my companion when, on our rounding the cape, countless headlands, one after the other, still lay ahead of us, without the slightest indication of an entrance to Lake Macquarie. We climbed up the hill, in order to make our way by a shortcut further inland. But we soon got entangled in thick scrub and bush, where coryphas were numerous, so we thought it more advisable to return to the sea-shore as quickly as possible. We had one advantage though; *Lambertia* had yielded us its sweet honey for breakfast, though in small quantities. After regaining the shore, we
crossed two fresh-water creeks, which came forth from green valleys. The Bangelorah Caves astonished us. They are wide fissures in the lower conglomerate, through which the sea dashed against the rocks with great force, washing out wide caves, in which numerous swallows are now nesting.

The rocks now became so steep and stood so close to the sea that we had to leave the shore to find a track inland. We very luckily found one. It took us across treeless, meadowlands covered with thick, high, but now dried-up grass, on which the sun smouldered. We dragged ourselves exhausted from one cluster of trees to the next; my fat companion was almost at the end of his tether. At last we sighted Moon Island, which is opposite the entrance to the Lake. This bolstered our strength, and we stepped out more vigorously. We noticed a hut, where we stretched ourselves out extremely tired, thirsty, and hungry. The owner of the hut arrived and took us in his boat to a fisherman’s house, where his wife refreshed us with tea and cold fish. Never had tea and cold fish tasted so good to me; almost better than the wine and fish of Montefiasconi. The friendly constable later took us to his own cottage, where his wife killed two young fowls for us.

So everywhere we found signs of the greatest hospitality and friendly benevolence. However, there was no ignoring the fact that in those places where they did not know my companion, people eyed us with suspicion. This manner of traveling and receiving hospitality is no longer possible in populous countries like those of Europe, but it is surely the way that still unites man with man, because the visitor, mindful of his host’s kindness, always takes on new obligations, endeavouring in his turn to be of use to others on another occasion. Maybe the accommodation would not be agreeable to the mollycoddled European, but since so much is learnt so quickly here, perhaps the ‘dandy traveller’ in France and Italy might discover unexpected sweetness in the Australian bushman’s tea-pot.

Lake Macquarie is separated from the sea by a sand-bar. Only a narrow channel is left, which changes almost daily, through which smaller vessels can depart at high tide. At low tide the depth is from 18″ to 2′, at high tide from 4′ to 5′. The annexed sketch will perhaps give a better idea of the conditions.
North-westerly winds carry the sand from the 9 mile sandy coast to the lake entrance. A dam from the northern shore towards Moon Island (in the direction), could keep back all this drifting sand.

On 22 November, we left our host and returned to Newcastle by a track across high wooded ridges already known to us for its greater part. However, I have yet to mention a bastard boy, whose father is a white man, his mother an Australian Black. The boy has a yellowish brown, not unpleasant colour. His nose is flat, its tip broad, but he has large and intelligent eyes, his forehead is broad, his hair black. The constable brought him up in his family from his earliest childhood, because his mother had died very early. The boy is diligent, obliging, and intelligent. He speaks English well, though there is something special about his pronunciation. He is in any case a great improvement on the native race!

24 November

On returning home on 22 November, I found letters from Mr Lynd, William, and Schmalfuss. The first reproached me for assisting the Murphys; William’s letter gave me fresh evidence of his unchangeable friendship; Schmalfuss announced to me the death of my youngest sister Mathilde, who had died in childbirth on the 11 November 1841. Her death moved me most deeply, since the healthy, open-minded girl had been dear to me above all others. But Schmalfuss’s letter so much took my mind back to the old country and he dimmed the painful feeling so skillfully with many old local reminiscences, that the mourning-letter was, in spite of all, a good letter of consolation. The depressing feeling of grief, however, associating itself with the fatigue of the journey, made me exhausted and sick. Gradually, however, my strength is coming back, body and mind are regaining their freshness, and my old wanderlust will soon drive me hence once more.

Every night a man plays English and Scottish tunes on his clarinet in front of our window. It is an occasion on which I feel how strange the English sphere of life is to me, as all the tunes affect me in a pleasant but unknown way, while the Englishmen sitting around me are filled with the joy and comfort of old reminiscences.

20[?] November ? 1842. Count Streleski was in Newcastle; he is leaving today. I have not yet seen him!


Just as I had written this letter, Mr Lynd, who is on his way to Port Macquarie, arrived, and now I had to repeat my letter to him orally. He brought me the money required for my journey.


4 December, 1842

For a long time the conical hills and the blue range of hills, which I glimpsed from our window on clear days at the other end of the widely curved shore, had aroused my curiosity. I had seen rocks from Pt. Stephens; a peculiar reddish porphyry and I decided therefore to pay those hills a visit. On Tuesday, 29 November, at three o’clock, I passed over to the northern shore and started my excursion all by myself, since on the one hand the walk seemed only a short one, and on the other, my companions di
not suit me. The tide began to come back and forced me to wade in deep loose sand, which was extremely tiring.

The whole northern shore consists of sandhills, which the sea probably has heaped up against the mouth of the Hunter River after uplift of the porphyry hills, in this way shutting off from it a long series of low-lying grounds from Telligerry Creek as far as the Hunter River. These were covered with alluvial soil, supporting luxuriant paludal vegetation. At least some had filled up so high that they are completely dry in very dry years. The line of sandhills between these morasses (swamps) and the sea is 1 to 4,5 miles wide and even wider, and has also gradually been covered with the usual bush vegetation.

On the northern bank I found a climbing plant with small green flowers, arranged in umbels, and with shield-shaped (peltate) leaves. It climbs from left to right and it seems to like sandy ground everywhere near the sea.

{“6 petals round the female flower, 5 sessile stigmata”}

On the sea shore itself I found spongin, the horn-coloured frame of which was covered with reddish soft crust. *Euphorbia* with fleshy leaves on the sandhills. An umbellifer, which spread over the sands and which tasted like celery, also had fleshy leaves.

A composite with fleshy oval leaves, tapering towards their bases (running down the leafstalk). *Dianella* with the most beautiful blue fruits. *Scaevola* with bluish berries. A fleshy *Ipomoea*, which together with *Mesembryanthemum aequilaterale* (pigs face), with *Correa alba*, and with *Spinifex*, are binding the sandhills next to the sea and striving to get the better of the play of the winds. About 8 miles from Newcastle, you have a good view of Nobbys Island, of the beacon and the elevation on which Newcastle is situated and which ends at Windmill Hill.

The sun has set, and the glimmer of its afterglow is playing through the *Fabricia* boughs in the trough-shaped hollow where I am lying. Here among the dunes covered with low scrub, I have lit a fire, in order to spend the coming night as comfortably as possible. I can hear the roaring sea, and I can clearly distinguish the breaking of the bigger waves, and in between there is a sound almost deceptively like human voices. Around me only the little black ant is busy, climbing up the branches of *Fabricia laevigata*, to milk *Coccus* of a peculiarly reddish colour, as if covered with dust. A solitary cricket is chirping here and there; the solitary call of a bird; but save these all is silent, listening, as it were, to the powerful roar of the sea.

It seems to me that a great number of plants are quickly spread by cow-dung over all parts of the bush: that is why at this lonely spot I discover the same composite (*Erigeron*), which grows so commonly on Ash Island and on all the cultivated places. Likewise there is a species of *Chenopodium* here – sticky.

The night was cold; especially toward dawn, around two and three o’clock, a strong dew fell, and I had repeatedly to replenish the fire and to change my position to warm my limbs in turn.

The day had broken on my last deep slumber, and the red disk of the sun, softened by a thick haze, had been standing for an hour high above the sea. I had brought bread from Newcastle and a bottle filled with cognac. Both made up my modest breakfast, since there was no water. As the haze, brought about by widespread bushfires, did not allow me to view the mountains, for which I was making, I decided to cross the sandhills to reach the edge of the swamps, and then walk along them to Telligerry, where Major Crummer, the police-officer of Newcastle, has a cattle station and a dairy. This route not only gave me the certainty of having sure accommodation for the night, but also promised me fresh water,
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which comes forth everywhere along the foot of the sandhills towards the swamps. Fresh water is generally found here in the sand at a certain depth near the sea, and it is interesting to observe how the lighter fresh-water rises and falls above the heavier sea-water during high-tide and low-tide.

At Telligerry milk and tea very soon restored my exhausted strength, and I walked on the dry mud in the vicinity of the huts through the dry swamp as far as the shallow sea-shore, which is not sandy here, but boggy, collecting a great many interesting plants. In the swamp itself grew Seaforthia and Corypha and Caladium, which at present is in full flower, filling the air with its extremely pleasant scent of violets. \textit{[Caladium macrorhizon subacaule foliis profunde cordatis repandes.]} The upper male part of the flower had been gnawed through by a host of small reddish staphylinids, of which I took home a large number. This \textit{Arum} had previously taught me a very sharp lesson. I was about to taste the inner white parenchyma of its thick, woody stalk, when the man, who is in charge of the cattle station, called out to me: “Watch out, sir; the plant is poisonous.” I did, however, taste a little, and, noticing a sweetish taste at first, I replied that he was probably mistaken. But immediately after I felt a considerable sting and burning on my tongue; at once I spat out what I had in my mouth, and rinsed it as best I could, but my tongue swelled and became so sensitive that I could hardly take any food all day, at least not without great pain. Besides the \textit{Caladium}, which draws our attention with its broad, fresh-green cordate leaves, \textit{Typha} was in flower. \textit{[Brown mentions only \textit{T. angustifolia}, but the leaves of my plant are by no means semicylindrical]} Several species of \textit{Carex}. \textit{C. pseudocyperus}, which grows also in the vicinity of Paris. As you get closer to the sea, a number of smaller plants appear, which always seem to occupy the same position relative to each other on swampy ground. In the swamp scrub I must also mention the native elder, which by its leaves and pithy stem calls to mind our elder, whose flower has, however, three outer and three inner, almost white petals and three filaments. The fruit is crowned with the remainder of the withered perianth; it has three compartments, each containing one seed, the ovule is pendant. \textit{Nephrodium} was in bloom. \textit{Carex} flowering and with fruits. Two species of \textit{Juncus}. \textit{A Polygonum} with hastate leaves; the centre vein, the leaf-stem, and the lower portion of the ochrea and even the stalk covered with stiff hairs turned downwards. \textit{[P. strigosum]}

A \textit{Convolvulus} is common. The violet (\textit{V. hederaefolia}) with pale bluish flowers was blooming all over the place. In the Big Swamp, of which the swamps of Telligerry form part, I frequently found a \textit{Hydrocotyle}; another one near Telligerry; a third when I came to the swamp of Hanobay. (I lost the last one, however).

I found a plant, which seemed to me to be very close to the \textit{Hydrocotyle}, however, the leaves are lanceolate and the flower-heads sit in the axils or at the end.

When we have a look at the distribution of the plants, we see the low sea-shore, which rises hardly a foot above the low-water mark, lined by a wreath of \textit{Avicennia tomentosa}. Below them the ground is palisaded right into the sea with the sticks of dead young avicennias. Next to this tall green wreath of trees, which fill the air with sweet scent of honey during the flowering-season, \textit{Salicornia indica} grows, which, as it were, forms a sward, on which the cattle come to graze from time to time. This is followed by a thick pale green grass, which I have not yet found in flower, with leaves arranged in two rows; then comes a \textit{Lepidosperma} (if I am not mistaken), no doubt a Cyperaceae with round, thin halms and leaves. A \textit{Juncus}, which resembles the
foregoing very much, appears next in larger bushes, either separate, or intermingled with the three foregoing ones. This lower vegetation forms an open space between the line of *Avicennia* and the tall trees of the swamp. Among the latter there are especially the swamp *Casuarina*, *Melaleuca*, *Seaforthia*, *Corypha* and in dry spots, *Eucalyptus*. [But in the depressions from which the sea-water cannot run off during low-tide, there are again *Avicennia* shrubs, which jointly with the foregoing give the whole landscape the appearance of a well-laid out English garden.]

At Telligerry on the casuarinas I had already previously found a *Loranthus* with wiry round leaves. An orchid, which is common at Dark Creek near Newcastle, with long wiry leaves, occurred here too. A number of chenopods and an amaranthacean[?] were also growing here. *Villarsia parnassifolia* was on the other side of the *Casuarina* thicket.

Also the wattle-tree, an *Acacia*, whose bark is full of tannin, but whose gum is transparent and lacks all astringent qualities, is now in full bloom. It grows in deep moist or fertile ground, especially on the edges of the swamps, and fills the air with a pleasant scent. A *Leptospermum* with small lanceolate pale green leaves was in flower.

A small greyish fly with a long abdomen and folded wings kept on tantalizing me at Telligerry whenever I stopped or sat down. When you are moving it is kept back by the draught, but as soon as you stop, it flies about your face, choosing particularly forehead and eyes as its pasture. It is commonly observed that Europeans, who come to New Holland, have to suffer far more from mosquitoes on their arrival than a year later. I think the explanation for this is to be found in the thickening of the epidermis, since with the “old” colonists the mosquitoes definitely prefer the forehead and the region around the eyes, which are always protected from the sun, to any other parts of the face.

I left Telligerry in the early morning, hoping to find, after ten miles, the home of a Mrs Connoli, from where I had the intention of visiting Point Stephens. But since the stockmen had not blazed the trees here to indicate the way to an inhabited place, I lost my bearings, when I got to the first cattle fence, from where cattle tracks diverged in all directions. These enclosures or stockyards may perhaps hold 50 to 100 head of cattle, and they serve to drive in the cattle from time to time, so that the cows that have calved can be separated, or in order to catch and brand the calves. The cattle in the bush are in the habit of wandering, like geese, in single file from one pasture to another or to the fresh-water pools. It is, therefore, always unsafe to follow such a cattle track, which is often well-trodden, resembling a man-made foot path. It is often rather annoying to lose every trace after three or four miles of the path, when the track arrives at a rich pasture, as the beasts spread out in all directions here. Or, as happens in this dry weather, you find yourself led to a dried-up water hole. Occasionally, however, these tracks will take the lost traveller to farms and houses, which is especially the case where dairy farms are established, to which the cows are driven daily.

On the tips of the branches the broad black cockroach (*Blatta*) was on the lookout everywhere; whether with the intention of catching insects, or to enjoy the fresh leaves of the young buds, I do not know. A small black ant had laid out covered paths for itself, out of sand grains, on tall *Eucalyptus* trees, and was busily running up and down on them. Similar covered passages are built by the soft termite with the pointed head. This termite, however, glues the grains of sand together with a kind of brown cement not unlike the one which I observed inside the termite-cone on Brisbane Water. On a cordate-leaved
Bossiaea I caught a Rhynchophorus, which looked very similar to the one of Ash Island, but differed on account of its simple white longitudinal lines. [In the cracks of Banksia bark, a black beetle.]

A Phalangista scuirea was caught just when it was about to hide in a tall Eucalyptus tree; it seemed to be half starved and could not escape.

Longer and shorter hilly ridges, perhaps 50' high, alternate with a terrain, which is delicately moulded by low, rounded hillocks and trough-shaped depressions. All have been formed of loose sand and are frequently covered with the remains of still extant sea-shells, which are often found in thick layers and used for burning lime. The low vegetation consists of Pteris esculenta and Antistheria (the kangaroo-grass), except where this has not also been destroyed right down to the roots by bushfires. The dry foliage of Eucalyptus trees and Banksia serrata lie thickly over the ground. The low shrubs are Persoonia salicina(?), Dodonaea triquetra, Acacia wattle, Dillwynia, Bossiaea, and here and there Leptospermum with hairy calyx. The trees are sometimes of great girth, but rarely very tall; the branches of the smooth-barked eucalypts are strangely twisted and their surface can be hard like the skin of a pachyderm. Banksia serrata is very common. A Eucalyptus with irregular bark. (This irregular bark strips off from time to time, however, and the tree is then smooth. The young branches are usually smooth from the first crotch. Another Eucalyptus is common, which detaches a more woody bark in long strips.)

Cicadas sing in full chorus on the Eucalyptus trees; a yellow-winged Acridium constantly leaps across my way, ants are busy on the ground, and a swarm of flies are flitting about the uncovered, freely perspiring parts of my body. The cork-tree, with red sappy young bark, approximately 25 ft to the first crotch; 30 to 35' high. The leaves seem to be lanceolate.

On a Monotoca I found a species of Cassytha covered with cherries; big green fruits, the ripest of which had lost their resinous taste and were of a very pleasant somewhat sour taste. I ate them without the slightest ill-effects.

When I came to the swamp and was walking along its edge through green wattle scrub, a wild dog lay in my way, in a moist nook formed by two contiguous sandhills. Its colour was a mottled brown. Immediately my footfall had roused it, it ran away at full speed. Numerous birds were hopping among the branches here, and a Phalangista scuirea was swinging from shrub to shrub. I crossed the swamp, large tracts of which were on fire, to get to the sea. Red fiery masses enveloped tall trees, which crackled around me in all directions. The smoke took my breath away. Never before had I been exposed to the danger of a bushfire to such an extent.

However, these great fires sweeping through the bush and to whose progress the grass, the shrub, and the sturdy tree alike, must succumb, offer a grand natural spectacle. Cattle herds, after goggling in amazement at the traveler for a moment, stampede from it, blindly breaking through bush and grass. In the calm bay surrounded by avicennias, flocks of wild ducks were looking for feed. As I was getting closer to the sea, I started from the grassy hollows covered with shrubs, numerous wallabies, which bobbed up above the shrubs, disappearing with long, catapult-like leaps. At last I found the long-expected porphyry on a hillock. At first it appeared as an irregular pile of boulders and blocks, the surface of which was covered with white lichens and which was decomposed down to a certain depth. The vegetation on this new soil differed little from that of the surrounding sandhills.
The forest *Casuarina* was somewhat more common; *Eucalyptus* was rare or absent altogether, but *Pteris* and the other low plants were the same. Eventually I reached treeless green grasslands, which formed the north-westerly slopes of hills and ranges, which were without vegetation and covered with angular pieces of the porphyry rock. They were partly of conical shape, partly widely curved or longish ridges, the latter being particularly the case with regard to those nearest to Port Stephens. Towards the sea, they formed precipitous cliffs and separated masses lay far out into the sea, with white waves dashing against them. At the second headland (if I am not mistaken), I found the porphyry traversed by a basaltic dyke, but it was by no means as regular as the dykes near Newcastle. A larger dyke, perhaps 15 feet long, and 3' to 4' wide, running from east-south-east to west-north-west (?), was accompanied by a parallel narrower one. Both suddenly stopped, being displaced sideways. The basalt contained much peridotite.

In the following bay I was delighted to find a spring, which was only poorly fed at present, under the thick shade of stegianas and blechnums. [I also found *Crinum* in blossom here.] I walked a mile or two inland, where I made a fire under the hanging branches of a *Casuarina*. Although hungry, I was refreshed by a dip and a drink. I sat down comfortably and finally, fanned by a gentle breeze, went to sleep. From time to time I was roused by a curious wallaby browsing around me. Early in the morning I felt the dew more strongly and therefore moved closer to the fire.

On 2 December, I returned to the sea-shore and followed the coast to Newcastle. I found several *Donax* beds and, as I was hungry, I ate a great many of them. They were, however, too salty, which caused me to eat only the foot, since the stomach and liver were very bitter. I found a lot of insects on the sea-shore, particularly *Cerambyx*, and a huge hemipteran. Also hawk-moths, which I had noticed in the homes, were frequently found drowned on the beach.

Continuing like this I returned to Newcastle at 2 o’clock, where my prolonged absence had already caused some concern.

I would like to add that half way, exhausted by hunger and heat, I found a cask of freshwater, which very conveniently for me had probably been thrown overboard from a ship in distress.

6 December 1842

Returning from yesterday’s wallaby-hunting, we found a large number of oysters sticking together in large clusters, not fastened on rocks or buried in the mud. Baker had fertilized Chinese peaches with almond-pollen and so bred a cross, which, however, offers few advantages.

In the morning a very hot wind was blowing, which had followed a cold southerly. In the afternoon we had rain lasting for several hours. It also rained through the night. This shows that the hot wind must have brought sufficient moisture to cause such a strong downpour.

11 December

On 9 December I left Newcastle in the morning to undertake a longer journey to Glendon, Bengal, and perhaps New England. For this purpose, I had bought a horse for £16, and the friendly owners, two young men called Calvert, who had come out with me on the same ship from England, assisted me by word and deed to make my journey as easy as possible. I provided myself with a few things, but still far more than the ordinary bushman does. A woolen
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blanket, 4 shirts, 4 pairs of socks, 1 extra pair of trousers, a hunting-coat (the numerous pockets of which were rather useful), a pair of strong boots, a tin pot to make tea in, and a smaller one to drink from, some tea and sugar, a rope to tether my horse during the night, a botanizing-tin, and some paper constituted my travel requisites. On the 9 December I rode from Calvert’s to Minmy, to Messrs Scott’s cattle station and dairy-farm, where I was cordially received by Mr Rorke, an old acquaintance. I had chosen this route, because I wanted to visit the Sugar Loaf again, which was marked on Mitchell’s map as consisting of trap, whereas I had previously found only loose sandstone, at least all around its foot, and the same conglomerate, which covers all the hills from Newcastle to Maitland and Brisbane Water and whose decomposed, iron-coloured boulders compose the ground over the hill and valley. The result of my walk yesterday was that the summit of the Sugar Loaf, where the tree stands marked by the surveyor, is formed of tall bare blocks of conglomerate, which stand out about 30’ above the surrounding tree-covered mountain proper. They are covered with white leaf-like lichens and yellow hair-like ones, and Polypodia confluens with a fleshy-stemmed orchid, while Davallia and Doryanthes excelsa and some Exocarpos have established themselves at their foot and between them.

Once again I had the opportunity of comparing the various Eucalyptus with each other. The spotted gum has probably received its name from the mottled appearance of its bark, as the half dried-up and almost dead pieces are brown, whereas the young bark is whitish-green. The iron-bark has a deeply split, rough bark, which does not peel off like that of the spotted gum. The stringy bark seems to have received its name from its bark, which comes off in long strings.

In the high tops of the eucalypts, hundreds of parrots were making a din. They move from tree to tree in small flocks and resemble starlings in the constant noise they make. A couple of white cockatoos were seen; they are very shy and remain on the uppermost tops of the highest trees. Their flight is gliding and like an eagle; their call is raucous. In the vicinity of Newcastle, around Mr Dawson’s station, I saw the black cockatoo on several occasions.

There are several settlements at the foot of the Sugar Loaf. The settlers are mainly occupied with cattle- and sheep-breeding. They cultivate only as much land as is necessary for their own subsistence.

We had the chance to catch a number of large cicadas. Two very similar species in particular attracted our attention – the one with broad red sound drums, the other larger with small black tympana, but with bulging drums. The tympanum of the first one consists of the following parts:

1. of a red 2½” long and wide tympanum, after a space two holes are seen, one of the
2. holes on each side – contains a convex, scarious, white, ribbed organ.
3. The 2nd hole – on each side of the midline shows a white taut membrane between a dark brown ring formed by transformation of the body segments.

If the abdomen serving as the bellows is separated, two muscles are perceived, which originate from the midline between the taut membranes, rising obliquely outwards and upwards and are inserted into a palette, which is set on the back edge of the membrane, but in addition is joined to it by a fine ligament. If the muscle is tightened, it pulls the palette inwards, which follows the stiff membrane. This causes a grating and crackling. This shows that a little tongue does not vibrate here, but a stiff
elastic membrane is pulled in and jerks back producing the noise, which is amplified to a deafening racket by a resonance board, by an empty abdomen and by tympana.

Explanation of the Figures.

1a the third pair of legs, b the red tympanum, c,d, e the abdominal rings

fig. 2. a.a the white inner drum b.b the outer ribbed convex membranes, which drawn inwards and jerking back vibrates c the inner brown edge of the drum, modification of the segments f.f membrane, which joins the last thorax segment and the first abdominal and drum segment.

fig. 3 Upper view of the back. a first segment and cover of the grating membrane b,c,d the following segments

fig. 4 a first segment partly separated to show the membrane ax lying under it.

fig. 5 Vertical view of the separated abdomen a first abdominal segment ax convex membrane. b.b muscles, which originate from an edge of the first segment axx and rise obliquely upwards to be inserted into a palette d.d, which is connected to the convex membrane ax by a small transparent ligament c.c.

I have noticed several times that male cicadas continued to live even if by chance their whole abdomen, with the exception perhaps of the first abdominal ring (or drum-ring) had been torn off. This shows that the abdomen does not enclose any vital organs, with the exception of the testicles and the rectum.

After walking for about 8 miles over hills and across a plain, covered with Eucalyptus and inhabited by large numbers of bronze-winged pigeons, we eventually arrived at a very simple hut, in front of which stood a small table with a tea-pot on it and some tin spoons. We went to the owner of the hut, who was busy erecting a wheat shock, to ask him the nearest way to the Sugar Loaf. He very obligingly gave us the information, adding: “If the gentlemen would seat themselves on these logs, tea will be served immediately.” Thanking him very much for the invitation, we sat down. He put his tea-pot on the fire, which was licking at the trunk-end of a thick, fallen Eucalyptus tree, and then searched his hens’ nests where he found some eggs. A piece of pork was also served. We had brought dampers with us, and as soon as the tea was ready, which our host sweetened for us, we enjoyed our simple meal chatting. After we had thanked him and took leave, we climbed the mountain which is about 2,000’ high. My companion, Mr Callaghan, sighted a rock-wallaby and, as I have already mentioned, we passed a large number of Doryanthes excelsa. At the foot Mirbelia was common, in fruit; a new species of Pultenaea with linear pointed prickly leaves; a Leptospermum with small flowers, such as I had found on my trip to Telligerry, a Bossiaea with cordate leaves; an Acacia with long linear leaves, flowers arranged in little heads, the heads growing from the axils singly or in pairs. Comesperma, Zamia, and Xanthorrhoea, which seems to be identical to the one at Dawson’s place.

The view from the Sugar Loaf is bounded to the north by some mountain ridges running
from east to west and to the east and south by the sea. Newcastle with Nobbys Island is very clear, and Lake Macquarie, with all its bays, lies open before our eyes. To the west the view is impeded by a cross-shaped ridge, and two mountain-tops, which almost equal the Sugar Loaf in height. The Hunter River is visible in some places and a succession of places that have been cleared of timber and cultivated. To the east a number of almost parallel ridges taper away; they repeatedly diverge without really diverting from the main direction. The water, which is found in water holes at the foot of the Sugar Loaf all the year round for the most part, runs down to the swamps on the Hunter River; the waters of Soldiers Flat, which extends towards Lake Macquarie, are probably drained off into the Lake. We had been told that we would have to follow one of these ridges in order to get to Minmy. The difficulty was that we did not know which one. After much hesitation and guessing, our kindly star led us to the right one, and after an arduous scramble we were back on the right track.

Let me also mention the termites, which here build hemispherical habitations out of grey clayey soil.

My companion drew my attention to a peculiar horizontal gnawing on some eucalypts, from which sap was oozing, eagerly being sucked up by metallic ants. My dog caught a thrush-like bird with a long slightly curved bill, very strong legs, sharp claws, a bald head, a fleshy protuberance between or behind the nostrils, and a feathery tongue. It is called ‘pie bald’. It made an incredible noise, when I grabbed it, hurting me painfully with its claws.

12 December

Last night a large male opossum was shot by moonlight. Neck and shoulders were a reddish-grey, back grey, abdomen reddish-yellow, a brown stripe on its breast between the forelegs. The end of the hairy tail was black. The underside of the tail bare. [Two very strong veins appear at the tip of the prehensile tail. The latter is strong enough to hold the heavy animal on the tree. The tip firmly gripping round the finger. The tongue has two glandulae circumvallatae at its base.] The pelt is thickly covered with soft hair over an inch long. Very large scrotum, testicles and epididymis very much developed (each testicle the size of a nightingale’s egg). The penis close to the anus, the glans a fleshy thin process; the urinal opening surrounded at its base by two caruncles. The deep base[?] of the glans with small turned-back horny tubercles. Anus and urinal region surrounded by long strong hairs.

Explanation of the sketch:

a. The general skin-torus, surrounding both parts and covered with hairs g.g.g.
b. Foreskin.
c. Base of glans.
d. Fleshy process of the glans.
e. Urinal opening.
f. Fleshy caruncles on both sides of the opening.
h. Anal-opening behind and above the penis.
The stomach consists of one cavity. The pylorus part slightly bent over upwards over the centre part of the stomach. It was filled with ground up *Eucalyptus* leaves and metallic insect elytra. The intestines were 18' long; the animal itself 2 ¾ from the tip of the nose to the tip of the tail.

The caecum is 3 ft long. The bladder was empty, very muscular; the base of the urethra was covered by a very spacious glandulose bag, which was bursting with a stiff fatty substance; it seemed to be connected by its opening with the urethra. The spleen has three tips, a broad one, a pointed one, and a tongue-like one.

The liver has about six distinct lobes – the left long one with two, the right one with three lobes.

The front part of the larynx is dilated like a bladder. It seems that the glottis itself shows some interesting details, but conditions were too poor for further dissection.
The brown snake about 3’ long, the head scutate. The nasal opening is in a scute, however, shielding the edge of a maxillary scale.

The body scales are elliptical, and small at the back of the head, increasing in size further back, weakly keeled. The tail 5″ has a simple row of broad ventral scales. I think that this snake is only a variety of the black snake.

In a shady gully, where good water is found throughout the summer in a hard rocky basin, I found several frogs and insects. The water has a yellowish colour and has a strongly aromatic, astringent flavour thanks to the Eucalyptus leaves falling into it. On the surface Didiscus were swimming about like glistening drops; in the water there was a species of small crab, similar to some marine crabs. Hygrometra was also here. A larger lizard was not caught, but two or three species of frogs. Leeches were also noticed.

One of the frogs was the green goldfrog. Between the two nostrils two gold-coloured lines meet, each of which continues over the eye and ear across the shoulders to the flanks as far as the inguinal region or the insertion of the hind feet. On the back some scattered golden spots. Golden stripes on the front part of the upper part of the forearm, loins, and leg, while the inguinal and hinder lumbar regions are a beautiful blue. Below the nasal opening a golden stripe; below the ear a white stripe. Throat white, breast and belly studded with small white warts or specks, but only under the upper arm and lumbar region. The tips of the toes are slightly palette-shaped. Teeth in the upper jaw and in the vomer? on one side of the inner nasal opening – two wide openings of the tuba eustachiana.

The pale yellow frog with black stripes above the tympanum descending to the back. Apart from this, spots of yellowish-green all over the body, but the rear part of the lumbar region mottled with black. Throat white, belly flesh-coloured, all the other features the same as the above mentioned, from which it is perhaps only distinguished by its age.

A small dark green frog with a white line from the eye across the tympanum. This frog is even smaller (5/4″ long), while the foregoing one is 1½″ and the first one 2½″ to 3″ long. They all seem to belong to the same species.

Acacia wattle (decurrens) and a large-leaved, white-barked Melaleuca grew above the gully. It was extremely hot; a scorching wind was blowing from the north-west. But I felt the same heat even where I was not struck by the wind. When I consider this dry aromatic heat, how it is found independently wherever there are singly growing Eucalyptus trees and casuarinas, and assume that a similar forest covers the greater part of Australia, I must admit that this completely explains these hot winds to me, which will be all the hotter the larger the area of Australia is over which they blow. The volatile oil of the Myrtaceae family may perhaps contribute greatly to the dryness of the air.
An *Acrydium* flecked with grey, with sharp-edged thorax, 3 lateral bands; the inner lumbar zone yellow with black spots. The large, reddish-brown, more than an inch long *Acrydium*, which I found here, was the same as in Sydney.

A long-legged spider was hidden under the rock; the first, second, and last pairs of feet were the longest. A white stripe on each side of the black thorax. The crab has pincers claws only on its second pair of feet, if I am not mistaken.

14 December

Mr Rorke and Mr Callaghan showed the Irish character to a high degree: good-natured, obliging, but extraordinarily apathetic, unless they were excited by something special. If they were worked up, at least the former was quick, exaggerating, laughing; but they soon fell back into their old apathy, smoked all day long, were dirty, and almost incapable of any other thoughts after they had fulfilled the narrow boundaries of their daily duties. My trip to the Sugar Loaf particularly revealed the good humour of my Irish companion. Although we lost our way and though I usually walked ahead of him quickly and restlessly, his face showed the same imperturbability and resignation to his fate. But such a man cannot make progress here, and not surprisingly Mr Callaghan has become bankrupt.

It was late when I rode from Minmy. We crossed the large, now dry swamp, which spreads everywhere between the high ridges descending from the Sugar Loaf towards the Hunter River, and because it is not much elevated above the water-level it is flooded by the high river water.

However, I must mention here an observation I made at Minmy. On 10 December we caught the larva of a cicada, which got out of its paper bag on 14 December, restlessly crawling about on the table. It succeeded in dropping to the floor and immediately hastened to the nearest wall, crawled up it about 2', fastened itself with its sharp claws, and then burst open along the centre line to bring forth a fully grown cicada. Though this had happened three days before I left Minmy, it had hardly fully developed its breast, which is, however, the broadest part of the creature, so that the rest of the body can quickly emerge from the opening once the breast has come out.

On the road I found a dead monitor. It was almost 3’ long; the tail 1 ¾ of the length of the body, keeled; the back black with yellow cross-patches and cross-bands; the belly yellow with black cross-bands; the forelegs had more distinct colours than the hind legs; the head was covered with small roundish scales; the tympanum was clear at the level of the eye or slightly below, the tongue split; teeth sharp, large, separate (standing apart). Anus in a transverse slit, no lumbar glands. A number of ticks (parasitic louse-like creatures) around the anus.

These ticks require special mention. Mr Scott told me that a single one could kill a dog. The dog gradually loses flesh, becomes lame in the hip, trembles and stumbles, and finally dies. These creatures originally live free in the bush, particularly in moist places, like Ash Island and the other islands; they stick to people (I removed one myself from Mr Scott’s side-whiskers), dogs, opossums (I found one on the opossum shot by Callaghan), snakes, and iguanas, and probably on many other animals. Whether they can really endanger the animal’s life, I do not know. Should it be true, it will probably depend on the part of the body to which they stick. [Mr Harper also assured me that this fear is justified.]

On very young trees of the spotted gum, I found the broad-leaved *Loranthus*, which I had seen on a very old *Eucalyptus* in Burwood.
About four miles before Maitland sandstone occurs; it is quarried close to Maitland, where it is used for building purposes. I saw a small church there and a chapel of hewn stone, which have the same slightly yellow colour as the Catholic church in Sydney.

Maitland consists of cottages scattered over a wide area. Some are made of timber and shabby; others of brick are very elegant; in addition there are regular houses two or three storeys high. The site consists of low, elongated hills. East Maitland is separated by a stream from West Maitland. The latter is laid out more regularly and more like a town. As you continue on the fine road to New England, these low hills gradually begin to swell, Harpers Hill and the neighbouring hills rising to considerable, arduous heights. Harpers Hill is cut by the road. Work has been done here for the geologist. A great number of fossils had already been shown to me at Newcastle. Now I am here to examine the locality more closely.

Mrs Harper, an old Scottish lady, received me with great hospitality. She is slightly hard of hearing, which renders conversation rather difficult. One of her sons, a boy of 13 years of age, has lost the normal use of his feet. He went swimming five years ago; whether he stayed in the water too long, or whether he suffered from the scorching sun right after his swim – he lost the full use of his legs, feeling a constant weakmess, and tripping over all the time. Like all the other boys of 13 years, he is well-fed, his arms and legs are fleshy, but his arms tremble. What can be done in this case?

There is less vigorous growth of trees on this rich black-brown soil than on the poor conglomerate soil of Newcastle. This is probably due to the greater humidity of the atmosphere. At the moment the grass is scorched everywhere. The vegetation has, however, not suffered in the least.

15 December

Ranges seen to the north of Mrs Harper’s house.

Continuation of the range towards the east.
The hill, on which the house has been built, consists of grey-greenish sandstone. It is formed from rounded pieces of a cavernous ferruginous conglomerate, which contains beautiful *Spirifer* apart from the pebbles. Moreover there is a kind of *meulière* scattered over the hillside; it is porous, often containing powdery masses, often indicative of organic substances, with druses of chalcedony. I also found the first granite boulders here. Sandstone cropped out, as I descended to the river. It changes to conglomerate further up, or the latter appears in large masses in the sandstone. It is surprising that so many shells were preserved in the conglomerate, since the grinding up of organic substances is so much hastened by the water rolling about the stones. But there seem to have existed particular conditions here, similar to those in the vicinity of Mr Brook’s place on Lake Macquarie, where iron-ochre, deposited in great quantity by a spring among the pebbles of the lake, bound them together more quickly than in the rest of the conglomerate.

I found a large number of shells in the sandstone, both at the foot of the hill and in the rock-wall in the garden, where *Trochus* was particularly common. Sometimes the shells are very well preserved. *Spirifer* has often retained its shell here. In addition *Terebratula* and *Pecten* (often very large ones) occur there. In a small hole I found a very large shell completely free, as the rock round the shell had decomposed. I saw several similar holes, but without shells. The mason bees have particularly built their nests in them. Perhaps they contributed to the widening of them.

At the moment the Hunter is hardly a continuous stream; large pools of water fill its empty bed, fed by random rains or by the moisture drained from the surrounding hills. You can walk dry shod across its bed. It is obvious from the formation of the terrain it must fill up very quickly. Everywhere there are high, rounded hills with gullies descending to the Hunter between them, in which the water running down from the heights collects and rushes down in wild forest streams to the main river. The river-banks are very steep in parts, in other parts they are flat; the bed is filled with pebbles. Among them I found a wide selection of the rocks of the higher-lying country, particularly porphyry, flint conglomerate (conglomerate the cement of which is extremely hard and seems to me to be flint). Phonolite? Anagenetic pebbles, which are like porphyry in some cases or partly consist of its components; the single pieces of which indicate, however, that they were abraded and later combined again. The porphyries have sometimes a red, or sometimes an almost violet or green, or even a yellow cement – some of them would be easy to polish. The rounded-off glassy crystals seem to me to be quartz. They are absent in some, but occur in others, which very much resemble trachytes or rather phonolites. Slate pebbles were also found, but I did not discover the slightest trace of limestone.

When I investigated the other side of the hill in the afternoon, I found broken sandstone slabs containing many impressions of zoophytes almost resembling *Flustra*. Madrepores and *Flustra* also occur in the conglomerate boulders of the hill.

In the river-bed grew a *Najas*, *Potamogeton*, and a plant with sword-shaped leaves and parallel veins. A *Limnaeus* – eye-stalks wide at the base, but tapering like a thread, the eye on the inner side. Two carinate *Planorbis*, which lay their eggs in little clumps on *Najas*.

*Casuarina* and *Cassia* were growing on the bank. Ants were very busy on the leaf-stalk glands of the latter. The membraneous placenta peeling off are interesting. A bluish larva of a beetle in the fruit. *Campanula* with linear leaves covered with stiff hairs. Tobacco in the garden. A peculiar pilose fern under the rocks of the hillside; a new *Hydrocotyle* at the bottom with a greyish *Oxalis* and *Apium*, presumably spreading from the garden.
A scorpion was found and the nest of the large brown-breasted ant between two slabs of rock. Its eggs were 2” to 3” long. Some ants had very big black heads.

This morning I investigated Harpers Hill. Climbing up a gully south of the homestead, amygdaloid rock was abundant, which contained chalcedony in its pores as well as feldspar crystals. The lowest rock was again sandstone, which everywhere shows tendency to conglomerate. On top of it there was a strange kind of rock, which very much reminded me of the peperite of the valley of the Limagne and of the peperino (Lago[?] albino) in its outward appearance. But there was no trace of pumice or tuffs. It was stratified and over it lay the ferruginous conglomerate containing shells (*Spirifer*). In other respects it is like decomposing basalt and I have a piece, which seems to indicate such an origin.

The road cutting shows on a large-scale the stratification of a greenish sandstone with a more whitish one further up, on top of which there are decomposed, rounded masses. Between the first two there is loose black soil in one place. It seems that the green sandstone once formed a steep cliff and that the valley was filled in those times with a reddish sandy clay, which now falls into small roundish pieces crumbling away during the summer heat. The greenish grey sandstone is hard and provides good building material. It frequently contains *Trochus* and *Spirifer*. The sandstone lying above contains impressions of *Equisetum obtuse striatum*(?), which make it the same age as the Newcastle rocks. From the top of Harpers Hill beautiful views are enjoyed in all directions. The mountain ranges to the north, which are silhouetted in lovely blue at various distances on the horizon, make a particularly beautiful view. Also to the south-west and south show several blue round mountain tops and mountain ranges. It is a pity that I have none of their names.

Probable cross-section of the terrain around Harpers Hill.

1. Alluvium of black or brown colour with boulders of porphyry and amygdaloid. Rocks and granite on top of it.
2. Iron coloured sandy clays visible in Harpers Hill, on the steep river-bank, in the ravines between the hills.
3. Coarse conglomerate, very iron coloured, with *Spirifer* washed loose in large pieces by the water and scattered over the hills.
5. A grey greenish sandstone, here and there with tendency to conglomerate. *Spirifer* and *Trochus*, often with the shell; often filled with calcspar. (Mrs Harper showed me a beautiful druse with calc spar crystals).
In addition *Pecten* and various other shells. In the upper strata *Equisetum obtuse striatum*. *Fenesta* (the *Flustra*), which occur particularly commonly in the gully below the stockyard. *Phyllotheca* as well.

A Is the sandstone in No 5 of the above cross-section, which here shows three different strata.

1. Is a fine, hard, greenish-grey rock.
2. Is a black loose earth.
3. Is a loose grey sandstone, which further up decomposes into large, rounded, ferruginous masses filled with *Spirifer*.
4. Is an iron-coloured sandy clay, which probably covered the former cliffs and filled an old valley.

I caught a spider, very similar to one of the Lycosa, which seemed to me to have only six eyes: four in the front row, two in the rear one. It was living underneath stones and without a web.

I found several species of *Eucalyptus*, which I must at last try to distinguish clearly.

1. The young tree with whitish, rush-like bark, the youngest twigs four-edged as a result of the descending leaf-stems, leaves broad, ovoid (ovate), pointed, colour pale green, edges whitish. Marginal vein irregularly curved. About eight principal veins on each side, alternating, running down the leaf-stem a little. 2” long, 5/4” wide. Leaves alternate.

2. Youngest twigs angularly compressed, red; the leaf-stems are also like this; the lower part of the mid vein and the edges of the leaves are red. More than 40 pairs of veins, close to each other. Regular marginal vein parallel to edge; fine network between veins; leaves lanceolate, long and pointed, sometimes ovate because of damaged tip, colour dark green; the fine network allows few translucent dots to be seen, but the strong scent reveals their presence. 3” to 4” long, 1” to 5/4” wide. Leaves alternate.
The Leichhardt diaries. Early travels in Australia during 1842–1844

leaves of some peach-trees had dried up. I was told that this was a result of the hot winds.

The drought has at least one advantage: it prevents development of the mosquitoes, which in wet summers are sufficient alone to turn the whole colony into half a hell. Harper junior told me that it had happened that one man had shorn 150 sheep in one day. Young mares are taken to the stallion at the age of two here.

What joy and expectation is caused by the postman! Here more than in the city, he is the most welcome visitor, no matter whether he brings sad news or glad tidings.

18 December

On Friday, December 16, I left Harper’s. I rode up a hill separated by a gully from the main ridge and then turned right towards the Hunter, whose wide basin, or former bed, became very obvious to me from these rather steep slopes. I saw the quarry from which the building-material for Harper’s house had been taken. The whole mountain towards Windham’s [Wyndham] place seems formed of it. It is a yellowish rock; only few strata are hard and suitable for use, the others come off in short laminae and crumble. The edge of the hill towards the river roughly and unusually trends from east to west. The old river-bed has secondary hills, probably alluvial masses. On the opposite side the Tangeren and Morrai Mountains come into view.

All the strata seem to dip to the north-west here, just as they do at Harpers Hill. The dip itself is low (about 25 to 30'). The red loam, and the pebbles and boulders, which cover the sandstone, seem to have been deposited by floods.

16 December

Yesterday in the garden, I had an opportunity of studying the different effects of drought on pear-, apple-, quince-, peach-, and apricot-trees, and the vine in contrast to the orange-trees. Whereas the former were covered with fresh vigorous foliage, the leaves of all the orange trees were all shriveled and bleached. I noticed, however, that the tips or centre parts of the leaves
In the pebbles of the sandstone (which itself graduates into pudding-stone or changes its nature), are mostly quartz and other kinds of sandstone, but also pebbles with clearly visible crystals reminiscent of porphyry. But I found no granite here. No fossils.

While I was climbing about the rocks, the dog had brought to bay an opossum, which had taken refuge in a crevice. I attempted to catch it, but the unruly dog seized it, killed it and tore it to pieces, before I could come to its aid.

When I arrived at Mr Windham’s fence gate, I was dismayed to find that I had left behind my botanizing-box in Harper’s quarry. I had no option but to turn the horse out to grass, while I walked back three English miles to look for the box. Fortunately the only punishment I received for my forgetfulness was tiredness.

I came to Windham’s, who have been living on the Hunter River for as long as 15 years, without being able to gain good economic independence for themselves. They are a large family. She is a woman of noble bearing and probably from a very good family. She is tall, but well-proportioned, has black hair and a fine complexion, large expressive eyes, friendly most of the time, but brimming with conversation. She told me that she and her husband taught their children themselves and that the children were really interested in learning. Mr Windham arrived later. He too proved to be an educated friendly, well-meaning man, who gave me information and advice on many points.

My intention was to see his vineyard and hear what he thought of the cultivation of the vine. Owing to lack of manpower, he has been neglecting his vineyard for the last two years, and the cattle have almost grazed it bare. It lies close to the bank of the Hunter on a sandy, mild but fertile elevation. It is surrounded by lemon-trees, whose fruit were completely shriveled as a result of the heat. The vines are 6′ away from each other, and the rows are the same distance from one another. The vines are very sturdy, real trees more than 6 feet in height, as in Italian vineyards. The sticks are thick, square, rough. His orange-trees are free of Coccus and black fungus.

Mr Windham told me that he lets the fermentation take place in a timber house, in which fresh air can freely enter all the time; the warmer the day the better. North-westerly winds are very welcome to him; the wilder and more unruly the fermentation, the better the wine will turn out. After three days, or when all is quiet, the wine is racked off and left in the barrels for a year. He once added sugar without deriving any advantage. The wine, which he offered me, was a strong spirited wine, but without a really pleasant full and aromatic flavour. Mr Dawson served me a bad quality wine of unpleasant, sour taste, which had been pressed as it were at Windham’s. Though Mr Windham had neglected his vineyard, he did assure me that his attempt had encouraged him to make new efforts. A vineyard on a large scale will in all probability be a success. He made, however, a discouraging statement: people do not want to drink his wine; they prefer tea by far. This might change with time, since although they are not accustomed to wine, Windham’s good-quality wine mixed with water really is a very pleasant drink.

Before I left him, he showed me his wool-press and his wine-house – a stone building serving as a cellar. Moreover he also had some pieces of limestone, which his wagons had brought back from a station (Gummon) in the Liverpool Range. This limestone resembled the travertine in the vicinity of Rome. It was deposited by springs, such as are still found in the neighbourhood. The cavities, in which reed stems had once been, were quite distinct.
He had a well sunk 60′ deep in front of his house. First he found 25′ clay, then 25′ of loose sand, and finally clay with pebbles, which seem to me to be alluvial.

From Windham’s I rode on to Mr Dawson, who rents land from Dr Mitchell, to investigate the locality, in which the much talked-of limestone is found.

On the evening of the 16th December, we had a heavy thunderstorm. It was not so much the loudness of the rolling thunder than the incessant electric discharge, an almost continuous light from lightning that was remarkable. The whole atmosphere was like a phosphorescent light, by which the trees, which simultaneously became visible, and the pouring waters combined in a strange landscape picture.

On the 17th we rode to the bush hut of a man called Johns, a butcher, at Black Creek, who described to us the way to the newly opened limestone quarry. We crossed Black Creek, a small stream, which takes a bend here and runs along the foot of a corresponding ridge, while a plain with slight elevations spreads to the north and north-east. We rode up that ridge and followed it for about half a mile until it was met by another ridge running from east to west. To the south of the latter there was another small valley with a small stream (Blind Creek), which was dry with the exception of a few deep water-holes. We rode on along this ridge for about two miles and found the indicated pit on its northern slope, in which they had searched for limestone. [I was told that the shepherds had discovered the limestone through the ants’ nests, which usually go down to a depth of several feet and bring up little pieces from below. However, since this presupposes a very sharp eye, I almost doubt the truth [of this story]. The ant hills may, however, have shown a whiter colour.] All along the way we had found pebbles and boulders of porphyry and particularly quartzite, but not even the smallest piece, nor the slightest change in the colour of the ground indicated the presence of limestone. In the pit I saw the following cross-section:

A thin crust of yellow loamy sand covered a 5/4′ deep bed of very red loam. Under this was a loose calcareous sinter, forming thicker and more solid pieces in some places: these pieces, however, contained quartz grains and boulders containing many quartz grains just like the sinter. Gradually the conglomerate became harder, and at a depth of 10 feet it was a very hard rock. In the top half, bands of calcareous sinter could clearly be seen to penetrate the conglomerate; further down all traces of it were lost. This seemed to me to show most clearly that the calcareous sinter was dissolved in a liquid, which deposited it as it penetrated to the bottom. These bands of calcareous sinter seem to descend towards the north.

Most of the boulders, which are in the conglomerate, were quartz and quartzite, but there was also that peculiar porphyry. It is, however, not correct to call it this. It is an indistinctly crystalline feldspar, or with discernible crystalline cleavage, which contains beautiful large quartz crystals more
than 2" wide. It should, therefore, be called pegmatite. While granite boulders are very rare, this rock is extremely common. I have constantly confused it with the porphyries of Pt. Stephens, but shall from now on use the name pegmatite. I found a genuine granite boulder in this calcareous sinter.

Mr Johns then took us to the hills on the opposite bank of Blind Creek, on which shepherds had successfully searched for limestone. Here we found the same red clay, the lower parts of which contained small pieces of lime that also looked like sinter. Under it there was about a half a foot or a foot thick layer of separate pieces of limestone, much more solid, but containing a great deal of flint. As we tested this rock with acetic acid, carbonic acid was noticed developing on its whitish edges, but the siliceous centre remained completely free from it. Further upstream, at the bottom of the creek, we found a strangely stratified clay, which later on changed into conglomerate; lower down it was coarse-grained loose sandstone.

{Would it be possible that this clay is detritus of the vegetable mould washed down from the mountains?} Nowhere did I find even a trace of fossils. [Mr Scott showed me conglomerate from the same locality. It contained lime, in which oyster-shells and, if I am not mistaken, Spirifer were visible. 21st December.]

I now believe that a perfect cross-section would show first red clay, then calcareous sinter, then conglomerate, which changes to coarse sandstone at a greater depth. This sandstone is probably a contemporaneous formation with that of Harpers Hill. The earthy clay-bed recalls to mind similar formations on Harpers Hill and in the gully near Harper’s house. Presumably Blind Creek was once the closed basin of a lake, in which a calcareous spring came out, depositing its lime on the bottom of this lake. Now there is no trace of it anymore; Blind Creek is the outlet of the lake. But if one were able to recognise the outline of the former basin, one would find the boundaries of the limestone. {The oysters disprove the assumption of a freshwater lake basin.} From the description of the limestone, it follows that one cannot expect too much of it and that it would never pay the transport from Mitchell’s land, nor even the quarrying. It is a very local formation of little thickness, which by no means remains the same. Presumably the whole basin was once covered with this sinter, but downpours eroded gullies and washed away the existing rocks.
A young man, who had lived a long time in Germany and speaks German well, showed me Mr Dawson’s horses. He has three beautiful stallions – Seegrave, Farmers Delight, and a third one, which is not quite so good. He drew my attention particularly to their full flanks and the long sloping shoulders. The former are dependent on a wide curvature of the last ribs. The colour is a dark brown without the slightest tinge of white – a feature which is highly valued. From September to January five mares can be covered per day.

Persoonia mollis and Angophora saligna(?), the apple-tree, is in blossom. At Mr Dawson’s stockyard I found a beautiful yellow malvacean, which stretches along the ground. In the trunk of the old Eucalyptus tree many green and red beetles and their larvae were found. Also an Anguis(?) blindworm of silver-grey colour, which had been drowned in the thunder-shower.

The morning after the thunderstorm, the heavy rainfall formed torrents, tearing down fences all over the place, but at the same time filling all the water-holes. Nature seemed to be awakening as from a stupor and, as it were, expanding her still heavy breast with the first deep breaths. The sky was hung with a low cloud cover; it was very sultry, and we had a kind of East Indian climate, a warm humid atmosphere.

Glendon, 21 December

I have now to catch up with a lot of things. At Belford, as Mr Dawson’s place is called, I watched the covering of mares for the first time in my life. In the morning they are taken to the stallion to find out whether they are in heat. This is recognised to be so when the mare begins to stall when near the stallion, or when she patiently bears his wild caresses, or when her vagina widens. She is not in heat when she begins to cry and lash out under the caresses of the stallion. With young mares it is often difficult to recognise, because they are too shy and will neither stall nor kick. The stallion, on catching sight of the mare, starts neighing, and his penis comes out. He comes closer, champing the bit. The mare neighs, and the stallion gnaws at her flanks, her neck, and knees (Achilles tendon), sniffing and, as it were, blowing at her teats and vagina by violently blasting his breath from his dilated nostrils. If the mare is in heat, he usually raises his head up and moves his lips in a peculiar way, which shows his teeth. For the actual covering the stable-hand lifts the mare’s tail and inserts the stallion’s penis into the vagina. Unless this is done quickly, the member will swell up so much that it will not fit into the vagina. In this case the stallion must break off till the penis is quite limp again. I noticed that after each erection of the member during the first attempts clear drops fell from the penis as it became limp. This seems to depend on another secretion, presumably that of the prostate. These various phenomena are important, since they are involuntary. At the commencement of the breeding-season the stallions are very quick in covering the mares, later they are calmer, but at the same time more productive. Seegrave, the thoroughbred, was far more lively, quicker, and wilder than Farmers Delight. The latter would, during the act, seize the mare’s neck with his mouth and hold on to it. The mare did not reveal the slightest sign of voluptuous feelings or sensual pleasure. After the covering, she either quietly remained where she was, or unconcernedly walked or galloped away. Dawson would normally take a mare to the stallion on the eighth or ninth day after she had foaled. [On jumping off some semen usually fell to the ground from the stallion’s member.]

A small beetle, probably belonging to the melolontha family, was in large numbers on Angophora saplings. A big red-legged scarab ran all about the ground, making a chirping
noise by rubbing its last broad body segment with the rear edge of the elytra.

In the morning one of the men brought two heavy eels, which he had caught in Black Creek after the violent thunderstorm. Mr Porter and I immediately set out to see the spot and catch more, if possible. We saw several eels near the bank with their heads out of the water, looking, as it were, asleep. The man who was accompanying us stole upon them with a sharp knife, which he thrust into their necks, trying at the same time to throw the animal onto the land. In this way we caught three eels, each more than 3′ long and 9″ in circumference, weighing up to 4 lbs. Later Mr Helenus Scott told me that the eels come up the banks to draw air, as they are accustomed to clear water and finding it at present full of dirt and clay particles, which impede their respiration, they are forced to breathe from the atmosphere. {The teeth are free and cover the jaws in large numbers} Mr Scott went on to say that three species of eels are to be distinguished: the thick eel, a slender species, and the silver-eel, the last tasting better than the other two. One of the men had slit open the eels and showed us the strips of fat hanging from both sides of the spinal cord into the abdominal cavity. I said that I believed they were the male genitals, at which remark he had a good laugh thinking it rather a silly opinion. {The small black tortoise is common in Black Creek.}

I found no teeth in the mouth of the small blind-worm; it cannot be poisonous, although it is decried as poisonous. It has fine shining scales all over the body and even partly over the eyes. The foremost ones (maxillary scales) are large. The anus is scarcely half an inch from the tail-end.

Miss Dawson showed me an acorn-shaped fruit, which is said to grow on the root of a low plant. If I remember correctly, it is a Zamia seed freed from its husk.

I shall always remember the friendly young man, who would really like to take an interest in science, but who has just lacked a magnet for strengthening him. His interest was aroused in all directions and after all in a case like his it is better to take in every new thing. His name is William Porter, from Essex in England. He seems of a good family and intends to return to England one day. He is an obliging, well-educated man, who is not only pleasant to get on with, but also instructive. He accompanied me to Mr Kelman, a Scotchman, to whom he introduced me. The latter has laid out a large vineyard and made wine. As it was of special importance for me to see this branch of agriculture, I did not intend to miss the opportunity of making myself familiar with the experience of this man. His vineyard is about 40′ above a gully, which, after some bends, falls into the Hunter. It contains water almost all the year round. There is a stiff clay at the bottom. The soil of the vineyard itself is reddish and yellowish sand intermixed with a slight clay and humus content (a light garden-soil), loose, easy to cultivate. {When pressed with the hand, it will retain the impression – this perhaps now only because of the moisture present.} Mr Kelman had only ploughed his garden without trenching it. At first he planted the vines at intervals of 6′ by 6′, training them 6′ high. He has, however, come to the conclusion that it is better to plant them 3 by 3 feet apart and drive in a stake from 15-18″. He does not tie up the vines, but lets them hang over. {Mr Bell follows the same principle in his garden.} The reason is he wishes to obtain good table-grapes and these require plenty of shade. He prunes the vine in autumn. Formerly he had tall stocks like Mr Windham, but now he has pruned them low, and trains long branches. He rejects summer pruning, because he thinks this would deprive the grapes of the necessary shade, which is perhaps true considering this rich climate. This supports
the Italian way of training grape-vines on trees as a good method for this climate. Instead of poplars and elm-trees, one might perhaps choose the Cape mulberry-tree. This year he had beautiful grapes, though not many, because he had just cut the old stocks back, and these were only bearing shoots from the old wood. He has red Alexandria, red and white Hermitage, Cornuta, Chazelas and many other kinds.

His fermentation is very wild and violent; it is often over within 24 hours. His fermenting-tub stood on a verandah closed in with boards, his wine-casks lay in a 4 foot deep vault-like hollow, over which a timber-hut had been erected, surrounded on three sides by a closed-in verandah. This cellar was cool compared with the outside air, but there was no thermometer for exact determination. His fermenting-tub was a very large wine-barrel, which he stood up vertically and knocked out the bottom. His wine-casks were mostly sherry-casks.

He has pressed out only the white Hermitage and the red Hermitage. The former is excellent; the latter tastes very flat. The colour of the white wine is greenish.

The vineyard is surrounded by a beautiful cactus-hedge. This cactus is very similar to the cactus Opuntia, but it has thick round stems and branches and retains its long spines. It comes from one of the South Sea Islands.

In addition he has planted a mulberry-hedge to the west, north-west, and north, to protect the vineyard from the hot winds. The Cape mulberry-tree grows very quickly and gives a pleasant though not too dense a shade. The track leading to his house is lined with aloes, which, in conjunction with the cactus, give the vineyard and house quite a tropical character. One of the aloes in front of the house has now pushed out its flower-stalk almost 30′ high, which is full of flower buds. If it is true that such a beautiful and noble plant dies down once it has ceased blooming, the reason for this seems to lie in its excessively rapid vegetation and in the exhaustion caused by it. One would, therefore, have to prevent the flowering as long as possible, in order to preserve the plant proper for a long time in its undiminished vigour.

Mr Kelman complained bitterly of bed-bugs, ants, birds, and thieves. He had piled up a high stack of wood over an ant-hill, which he lit in the evening. When I went there in the morning, I saw that the three wide paths radiating from the hill were covered with the same crowd of ants, which were coming home from a distance, running into the ashes, but turning back when they felt the heat. One of these paths led to a flowering Angophora tree. I could not help thinking of that prophecy, according to which England would be engulfed by an earthquake. Thus the countless ships would return and steer across the vanished homeland they were looking for. [The ants’ nests often reach down to a depth of 5′ and the animals withdraw to the lowest parts as they feel the heat. Consequently a big fire has to be maintained for a long time to choke them.]

In the orchard he had apricots and the red-flowered small peaches ripening; a black fig and a brown one (the latter softer and juicier). A black fig-tree was particularly beautiful. He planted one new variety of fig with deeply lobed leaves, which is said to bear well. At his house he has an American vine with insignificantly lobed leaves, which yields few and little-valued grapes, but offers plenty of shade. The mulberry-tree bore beautiful large black fruit. The colour was excellent and could perhaps serve to colour the wine.

The magpie, a black-and white-coloured bird, is here in large numbers. There is one sitting just now on the flowering stalk of the aloe; it has a somewhat gurgling song. [These, the parrots and leatherheads do great damage to the fruit. They are extremely fond of figs.]
The orange trees are only slightly covered with cocci, but there is no black fungus.

Yesterday morning, December 20, I left this friendly family, and rode to Glendon. Mr Kelman, however, accompanied me to show me a coal-bed. Not far from his house we rode across the Hunter. On the northern side rose high hills, all of which consist of sandstone. This sandstone seems to be of the same nature as that of the hills between Harper’s and Windham’s. As I was inspecting the quarry, my horse, which I had left untethered, walked slowly away, and conscious of its liberty, ran away from me when I wanted to catch it again. Mr Kelman had a sharp ride to recapture it for me.

Mr Helenus Scott and also his wife received me in a very friendly way. He is one of those men, with whom one immediately feels familiar. It was like meeting an old friend again, and I could not at first account for this feeling. Later, however, I found that Mr Helenus Scott bore a great resemblance to two men I had known previously. One had come out with me from England, the other was Mr Robert Scott of Sydney, whose voice and eyes I found again in Helenus Scott.

In the afternoon he accompanied me to the steep banks of the Hunter, where there was a very interesting site: blue clays, which contained pseudomorph crystals and round nodules, lay on large sandstone lenses. Thirty and more of them had been stripped by the water of the clay cover and now showed a regular decomposition. The joining partly ran from ESE to WNW; partly from the periphery to the centre. In addition the joints differed slightly in the flat river-bank; one joint went from E by S to W by N, the other cut the former diagonally, so that rhombic figures were formed. Over the blue clays there was again sandstone, which changed to the nature of pudding-stone.

Those huge sandstone lenses, which effervesce a little with acid, showed the greatest convexity on top and lesser on the bottom. Perhaps the latter was caused by the longer action of the water. They resembled round haystacks or gigantic bee-hives. Sir Thomas Mitchell had tried to determine their position relative to one another, but there was no evidence of any definite rule; occasionally there are three in a row and the fourth is different. I was thinking of local springs containing limestone, which bound the sand-masses more closely as the limestone was deposited in them. Mr Clarke seems to have thought of an explanation by volcanic activity, of which there is, however, no trace.

Mr Scott drew my attention to the peculiar shape of the flat terrain, which showed slight hollows and elevations all over it, which sometimes continued in regular rows. When they had asked the savages about the cause, they replied that it had probably been done by the devil-devil many years ago, and that was why this ground formation was called the Devil-devil land. [The Devil-devil lands proper, however, are continuous elevations and their origin is very difficult to explain] It seems to me, however, that there are several reasons for this formation. The burnt-out roots of trees left hollows behind; the water, without outlet on a plain, formed puddles, which gradually deepened, unless already existing depressions develop a more definite shape.

Growing on this rich soil we found a plant with finely pinnate leaves, *Mimosa terminalis*, the little leaves of which fold upwards when touched; the yellow flowers are united in little flower-heads; each flower seems to have five yellow petals. The stem is weak and prostrate. *Lobelia serrata*. The leaves are serrated and arranged in two rows; the plant lies flat on the ground.

A tree of medium height grew on the Hunter, with white tubular flowers in