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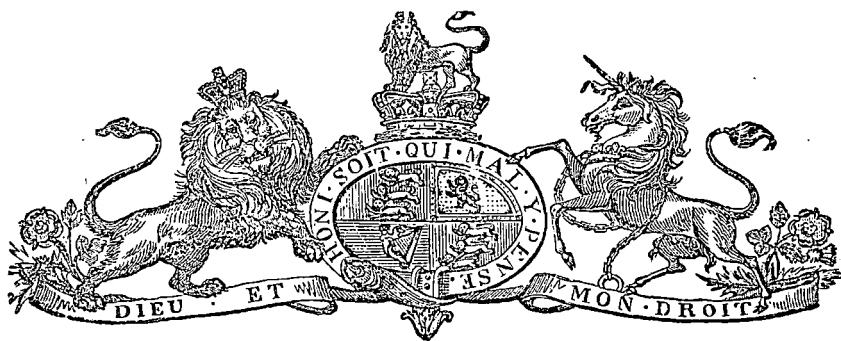
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REPORT OF THE GEOLOGICAL SURVEYOR.

COUNTY DORSET.

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Laid upon the Table by the Colonial Treasurer, and ordered by the House to be printed, 21 July, 1864.



*Geological Survey Office, 18th July, 1864.*

SIR,

I HAVE the honor to forward a Report upon the Geological structure of a part of the County of Dorset.

I beg to remain,  
Sir,

Your obedient Servant,

CHARLES GOULD.

*The Hon. the Colonial Secretary.*

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## R E P O R T.

SIR,

I HAVE the honor to forward a second Section of the Geological Map of the County of Dorset; and, in anticipation of any remarks upon the structure of the entire Country, I forward herewith such explanations as will enable you to understand the portion already completed.

The first Section included the country lying north of Mount Direction, between the Piper and Tamar Rivers. The present contains a larger portion of the country between the Piper and Ringarooma Rivers.

In each of these the geological boundaries are traced as carefully as the means at my disposal, and the nature of the country, permitted; while in those localities remote from lines and points determined by exact survey they are approximately expressed in broken lines.

The marked geological features of the northern half of the country, contrasting with those of the more completely settled and better known districts of the Colony, appear to be, the absence of the fossiliferous limestones and associated coal formations, the small proportion of greenstone or secondary trap, the abundance of granite, and the extension northwards of rocks in part identical with the Silurian schists of Fingal or closely related to them.

The geographical features of principal importance are two: the first, a greenstone-capped tier about one thousand feet high running parallel with the Tamar, at a few miles distance from it, and passing through Mount Direction, Mount Dismal, the Tippagory, and Mount George; the other, a V-shaped extension of the Mount Arthur range, pointing to the east and west of north, and variously known as Hall's Tier, the Blue Tier, and Sidling Hill.

The first radiates from Launceston, and consequently presents no obstacle to road communication with that city. The direction of the second is transverse, and it presents a barrier to communication with the coast lands as well as the agricultural district known as Scott's New Country. As regards minor features, the country between Piper River and the Tippagory range is chiefly occupied by a series of more or less parallel ridges forming the Den ranges, which gradually melt away into undulating country and plain land as they approach the coast, retaining their prominence, however, at Fourteen-mile Bluff to within a short distance of it. East of the Piper, the country is on the whole similarly broken, undulating, or plain according to the distance from the main tier and its lateral extensions.

Of the rivers draining this area, the principal are the Piper and the Great Forester. The first pursues an almost due north course to the coast; the latter is deflected in a half circle to the eastward; both are of inconsiderable size, but afford shelter at their mouths to vessels of 40 tons burthen.

The main physical features are subordinate, as is noticeable in most parts of the Colony, to the geological structure. The Tertiary and recent deposits form extensive tracts of semi-waste plain land littoral to the sea, while the harder and older deposits rise from them in spurs and ridges terminating in the main tiers, the prominence of which is due to their protection by cappings of trappean or silicious rock.

The more recent basalts form tabular expansions of various extent and elevation disposed on table land or in river basins.

In most cases the mask of vegetation faithfully portrays the nature of the rock below; the various geological regions being clearly indicated by the grass tree plains, the heathy undulating ridges, the native hop ranges, the dense scrubs flanking the tiers, and the lofty gum forests with their undergrowth of ferns, &c.

There are two points interesting in an economic sense:—1st. The wide distribution of a formation to some extent auriferous. 2nd. The existence of considerable areas of land fit for agriculture.

The Tertiary deposits have but little intrinsic interest, consisting merely of layers of sand, clay, shingle, and pebbles, which form grass tree and heathy plains alternating with reedy marshes. They are but little elevated above the sea, and afford scanty pasturage, improving in the vicinity of basalt. These are sometimes, but rarely, disposed in terraces of slightly increasing elevation in proportion to the distance from the sea.

It is difficult to define their limits,—indeed to do so would require a very detailed survey; the Palæozoic deposits being covered in places to a distance of many miles from the coast by a drift of sand, clay, and rounded quartz pebbles, partly marine, and partly derived from the destruction of the rock themselves. They appear to be to a great extent destitute of fossils. In one instance near the Tamar Heads a tufaceous limestone occurs in thin shelves, outcropping from the sand hills and upon the beach: it is not very abundant, and contains no fossils.

The upper and lower Palæozoic deposits represented in the present section of the map are extensions from the better developed and more accessible countries to the southward: they are difficult of study, and present no clue as to their age either by fossils or relative position. It will, therefore, be necessary to trace up the connections from situations affording reliable evidence; and I consequently defer my observations on these formations until the completion of the survey of the geological area in which they occur. I may state, however, that the latter appear to be closely related to the Fingal schists, from which they chiefly differ in being much more arenaceous than argillaceous, consisting chiefly of hardened sandstones and grits which have the ordinary strike of N. 35 W., S. 35 E., are elevated and contorted, and to some extent traversed by quartz veins. They form ordinarily a barren country, and their surface is to a variable degree strewed with quartz drift. This must not be confounded with the recent marine drift of *rounded* pebbles, which is also, to a large extent, distributed over the lower portions of the surface of their formations, and which leads persons unacquainted with the drift to entertain exaggerated opinions of the auriferous character of this country. Gold has, indeed, been found in small quantities at many points throughout the district, and in some instances the character of the gold has been such as to indicate its source to be near at hand; and although the aspect of the formation, as a whole, is not favorable to the existence of auriferous deposits of value, there are, to a limited extent, places of much promise, presenting great facilities for being prospected. Thus, for instance, the ranges running north-westerly from the Devil's Den towards George Town offer a network of gullies ramifying through clay-slate hills and filled with the debris of such reefs as traverse them. The character of these ranges, however, is not in a marked degree quartziferous; but inasmuch as the higher Silurian deposits of Victoria, containing some of the most productive reefs, are noticeable for holding them only in small proportion and of little extent, this character is not necessarily adverse to their being productive of gold. Among the places in which gold has been already obtained may be enumerated the Devil's Den, the third branch of the Piper, Nine Mile Springs, and the vicinity of the Little Forester.

At the Devil's Den the workings have been of a limited character, and to some extent useless: in one portion of the workings I found a shaft sunk through the thin coating of superficial drift upon the summit of a hill, and thence downwards to the depth of between 70 and 80 feet in the solid rock, which consisted of buff-coloured argillaceous rock, with the bedding fairly shown, and the character of the formation explicitly indicated by strings of quartz traversing the shaft from top to bottom. *The practical men still hoped to reach a bottom.* Besides several shafts, workings have been effected in the lower portions of the gullies, where the drift proves of inconsiderable depth, in the form of paddocks: there is, however, much water, and the amount of gold obtained was unremunerative.

Small quantities of gold have also been obtained at the mouth of the third branch of the Piper's River, and in the open valleys bordering on the Little Forester River.

The lower portions of the country occupied by this formation are, for purposes of occupation, almost worthless; but on the flanks and summits of the tiers, where the rock appears to be more argillaceous, the land is of fair quality. I have no means of estimating with accuracy the amount of land available on this formation.

The upper Palæozoic deposit consists of coarse friable buff-coloured and white sandstones, with conglomerates formed of mixtures of sand and clay, and a small proportion of quartz pebbles, indurated clay, and grits. I have obtained no fossils from it. Sections are not abundant, but some tolerable ones exist under Mount Dismal, and upon the left hand of the George Town Road. The dip is generally very trifling. I believe this formation to be Palæozoic, and it may include a portion of the coal measures. The land upon it is generally of inferior quality, but susceptible of cultivation, and such as will probably be absorbed into occupation when the better lands of the Colony are exhausted.

The granitic rocks will be treated of when the great area occupied by them to the eastward has been surveyed.

Agreeably to the suggestion of the Hon. the Colonial Treasurer, I have directed my attention to the economic features of the next formation. My observations show that the apparent mineral characteristics of the numerous patches of basalt distributed over this portion of the Colony are not sufficiently striking to enable us to identify them as belonging to distinct groups, distinct that is to say in point of age, although the country formed by them presents very great differences in point of appearance and value; nor, so far as I have observed, are the differences in this respect between the several varieties of this rock existing in different localities greater, in many instances, than those which may be observed in different portions of the same mass.

Nothing, however, can be greater than their variety in an economic point of view. Thus we have basalt land passing through various degrees of value, from the finely grassed low wattle scrubbed plateaus, resembling those forming so much of the sheep pasture land in the centre and southern parts of the Island, but here existing in smaller and isolated areas at various points in the vicinity of the Piper, and along the margin of the Coast. Through the gum forest land, with a moderate undergrowth of coarse grass, brake fern, indigo plant, &c., as at various points along the Piper and Little Forester Rivers. Through the more open portion of the extensive table lands in the basin of the Ringarooma, where the growth of forest timber in the shape of swamp-gum, light-wood, and wattle is supplemented by an undergrowth of doghead ferns, brake ferns, fire weed, and nettles, and culminating in the magnificent forests of Scott's New Country, where, in addition to the vegetation last described, the interval between the larger timber is occupied by a dense thicket of dogwood, native currant, tree ferns, musk-wood, &c.

In this respect, then, they can be subdivided into four classes, although, it must be admitted, without any very trenchant distinction or obvious cause. Indeed it is questionable whether in either of these instances any real difference exists in the nature of the soil produced, or whether the apparent difference may not be attributable to the various extent to which disintegration has proceeded, and depth of soil resulted.

In the poorer varieties the rock is barely covered by soil, and protrudes at many points; in the richer it is covered to a greater depth; while in the richest of all, as at Scott's New Country and Ringarooma, it is not uncommon to find the rock decomposed to a depth of as much as twenty or even twenty-five feet.

It is rarely that the structure of large masses is observable, but a distinctly columnar structure (the columns being vertical) is exhibited at several points along the course of the Piper River and upon the coast. In some instances the axes of the columns are inclined, while in a magnificent cliff section, afforded by the Black Bluff at a few miles distance from the mouth of the Piper, they are horizontal. This is the first instance of the kind that I have met with in the Colony. The basalt is ordinarily dark blue, compact, and without foreign minerals; sometimes grey, more or less vesicular, and containing small quantities of a soft greenish-grey soapy mineral not yet submitted to analysis. And I must here take the opportunity of submitting that a careful analysis of the more prominent varieties, assisted by a comparison with those made of the recent trap rocks of Victoria, would doubtless lend material assistance to our efforts in classifying them; and would at once solve the question whether the variations in soil produced are due to differences of chemical composition, or to the external influences of position, climate, and circumstances of cooling.

Assuming that no great differences exist in point of age, the question as to what that may be lies within narrow limits. In a section exhibited in a hill some two hundred feet in height, near the Forks of the Little Forester, the clay-slate underlies a layer of from 15 to 20 feet in thickness of quartz boulders, pebbles of sandstone, grit, and other materials from the adjacent formation, consolidated into a conglomerate and set in a matrix of sand and clay cemented together with oxide of iron. Above this there is a sheet of basalt of from 20 to 30 feet in thickness. Similar sections occur in other parts

of the same locality. The materials of this conglomerate are identical with those forming the loose drift obscuring so large a portion of the district ; and their consolidation is evidently due to the subsequent overflow of the basalt. Again in the vicinity of the Piper River evidence is afforded that the flow of the basalt has taken place subsequently to the formation of a part at least of the marine drift which is so largely developed there ; and in Scott's New Country some of the well sections show basaltic material overlying a considerable thickness of granitic drift and gravel. Upon the other hand, the country between the Piper and George Town show in many places basalt peering through, and imperfectly covered by, the sandy deposits bordering the coast line. This covering may, however, have been effected by aerial and not by marine action : at all events, the evidence is sufficient to prove that the flow of the basalt has taken place subsequent to, or very nearly at the same time as, the formation of the late Tertiary drifts.

Reverting to our practically useful sub-division and glancing at the map, I may observe that basaltic patches indicated as existing along the course of the Back Creek, and at Weymouth, Lulworth, and various points along the coast line, belong mostly to the first or least valuable variety. There is considerable difference though even amongst these, depending on the extent to which they are deteriorated by, or freer from, the admixture of sand ; indeed, the intimate connection between them renders it probable that a large proportion of the flats along the Coast consist of basalt concealed beneath a superficial covering of sand. The few scattered farms along the Piper (it must be understood that I am referring only to those coming within the limits of the present map) are mostly situated on the second or better variety of ground ; and to the same class may be referred the ground at Fern Hill, Stephenson's Hill, and in part the land cultivated at the Piper, and on the road laid out by Mr. Hall from Bridport to Launceston. The basaltic lands of Ringarooma and Scott's New Country are sufficiently extensive to demand special notice.

At Ringarooma—and in explanation I may remark that this term has by local custom been appropriated to the District fronting on the river near the Township of Maurice quite as strongly, as it is also and more properly applied to that near the Township of Ringarooma, situated at the mouth of the river, and nearly 30 miles in distance from the first—the basaltic area, as far as it is yet known, extends in a north and south direction for nearly 16 miles, the maximum width of nearly four miles to the southward, at about two miles distance from the Township of Maurice. The greater part of this lies upon the western side of the river ; that on the eastern having been as yet only partially and imperfectly investigated,—in fact, the course of the river, after leaving Mr. Scott's Plain at the Great Bend to the eastward, is not only unsurveyed, but almost unknown, while the country intervening between this river and the slopes of Mount Victoria is equally imperfectly explored. Whether there is any extension eastward of this formation, remains therefore for determination,—the advanced period of the year having compelled me at present to confine my attention to the more accessible localities ; but I hope to include it in the next section of the map which I shall forward. To the southward this area is terminated by a ridge, an offshoot from the north and south range, running parallel with the river at three or four miles distance from it ; upon the west it merges in the myrtle flats, extending along the base of the same range. It lies in the basin of the Ringarooma, forming a level or gently undulating country, slightly elevated above the river to the southward, and gradually increasing in this respect as it advances to the north, but without any chance of being flooded. It is well watered by numerous creeks. The soil is of a chocolate colour, and it appears generally to be of considerable depth. The timber consists chiefly of lightwood, wattle, and swamp gum. The mass of it is free from underscrub ; but in places, and more especially towards the margin of Scott's New Country, in the open part, the undergrowth of ferns and tree ferns can be cleared at a trifling expense.

The occupied portion of Scott's New Country forms an irregular oval area, about seven miles long by three broad, and includes seven thousand acres of first class land. It is a low table land, deeply indented by valleys on every side. From well sections it is seen to consist of basalt overlying granite drift, and the lower parts of the valleys show granite rock in boulders and *in situ*. The well sections often show from fifteen to twenty feet of rich pulverulent chocolate-coloured soil, from which a perfect drainage is afforded by the subjacent granite drift. The growth of timber is magnificent. It consists chiefly of swamp gum or stringy gum ; the trees frequently measuring 40 or 50 feet round. Wattles and lightwood are interspersed here and there, and the intervals closely packed with a dense scrub of dogwood, musk, native currants, tree ferns, &c. : towards the margin the scrub is less dense.

Although only occupied within the last few years, great progress has been made in clearing it. The population already numbers one hundred and fifty, and the export of grain for the present season was estimated to be five thousand bushels. It may, therefore, be fairly assumed that a few years bringing with them improved means of communication, and a more perfect system of agriculture, will see this District develop into one of the most important in the Colony. Hitherto the landholders have been working under no little discouragement. The road surveyed from the north end of the District to the Port never having been opened for traffic, the export and import of all articles has been conducted *viâ* Mr. B. Brewer's station upon the Forester. By this the distance was increased by at least six miles, and the Settlers in the more remote portions had to cart their produce as much as twenty miles before shipment.

I would direct your attention to two facts in connection with Scott's New Country, facts which would equally apply to all similar rich lands throughout the Colony. The first is the rapidly approaching destruction and utter waste of one of the finest beds of timber in the country; the other is the probable conversion into pastoral lands (at least to a great extent) of what might become one of its most important grain-producing districts. Unless remedied, these results are as certain as the cause is obvious.

The distance from the port, and the absence of any direct road to it, impose so heavy a tax upon the grain-grower, that he finds it more profitable to lay his land down in grass than in grain; while the export of timber is, at the same time, entirely prohibited: for as it is impossible to turn the trees into money, and as it would cost twenty times the value of the land to clear them away entirely, the farmer is obliged to adopt the compromise which forms an essential leading feature of the farming system on the North Coast; viz., of ringing the trees and leaving them to die.

It may perhaps, at first sight, appear questionable whether any real loss is sustained by the individual from the conversion of agricultural into pastoral land: this is a point which it would be out of my province to discuss, but I apprehend that there can be no question as to a certain loss being sustained by the Colony; the proportion of labour employed upon the land, and the population supported, being so much less considerable in the one case than in the other.

With regard to the timber, the loss is more serious and more certain both to the individual and to the Colony: for the first few years after the death of the tree a considerable per-centage of the crop is annually destroyed by the fall of the bark and limbs; and after the lapse of a few years the trunks themselves gradually begin to fall, each probably destroying a large proportion of the crop and costing a considerable sum to clear away; they may then be considered as constituting a heavy rent-charge upon the land, which is not entirely free from it for many years. This is the loss to the individual. Upon the other hand, an article of export, exceeding in value that of the land itself at least ten-fold, is utterly and finally destroyed, and in such a manner that, in place of contributing to the profits derivable from the land, it is converted into an expensive incumbrance on it, whilst the positive loss sustained affects the general interests of the Colony almost equally with those of the individual.

Assuming the nett value of the timber in Scott's New Country at only £5 per acre,—and this I imagine to be a low estimate,—timber to the nett value of £40,000 or £50,000 will in this manner be entirely destroyed within the course of a few years; or, in other words, that amount of stock will be wasted in the district.

This, then, presents one more example of the beneficial results which would attend the construction of a tramway, or some other medium of cheap transport. The timber would be utilised, an extensive export trade established, and an impulse given to agricultural operations; the land laid down in grain instead of pasture; an increased population supported, and the district converted into an integral part of the Colony, in place of being isolated from it. This isolation has been enhanced by the absence of any direct practicable road to Launceston; and the existing road, besides making a *détour* of nearly 30 miles, passes a number of rivers all unbridged, so that after rain, in common with the inhabitants of the coast, they are shut off from communication with the capital for days together.

The statement of the cost of clearing this land may be interesting for comparison with that incurred for clearing similar land in other parts of the Colony. The clearing consists simply in ringing the timber and levelling the scrub in the early part of the season, and burning the scrub and clearing up the ground in the later. The maximum price which came under my notice was £6 per acre, but the average cost appeared to be between £3 and £4.

It is also worthy of remark, that some of the best crops have been obtained by simply sowing the grain broadcast on the ground immediately after the scrub was burnt off, and without the ordinary process of ploughing.

In conclusion, according to your wish, I direct your attention to the area of agricultural land available for occupation, and the road communication which it would be desirable to open for that purpose.

The existing lines of road, independent of the circuitous route by way of the Piper and Coast, are three: the first, a road surveyed by Mr. Hall, running from Tyson's saw-mill and terminating in the Coast road, about half a mile from the west bank of the Little Forester River; the second, starting from Patersonia, and terminating in Ringarooma. The third leading from Bridport to Scott's New Country, and thence into the second or Mr. Gordon Burgess's Road. There is also an unsurveyed track leading from Boone's selection in Scott's New Country to Mr. Scott's land at Ringarooma.

Mr. Hall's road is 33½ miles in length, and passes through the occupied lands near the head of the Piper River, and through the rich scrub land on the summit of the tier to the north of it: of

this land but little is selected, and only one selection occupied. I estimate that at least 5000 acres of good land would be opened up at once by this road being made practicable for carts to a shipping place; at present it is only available for horses. The distance of the occupied selection (Chester's) from Launceston is 23 miles,—from Bridport about the same. I am unable to say what the relative expenses of forming the road in the two directions might be; but one advantage is certainly possessed by the northern half of the road, in the fact that no hills are encountered after the descent of the tier, so that the carriage of all produce would be down-hill to the port, whereas towards Launceston the road passes over several difficult hills of considerable height. In fact, the first part of the road needs only a few variations, and a moderate expenditure for side cuttings, to render it passable at once: the complete formation of the road might be deferred until the land had been occupied, and to some extent cultivated.

A larger area, difficult of definition, would also eventually be occupied lying along the northern flanks of the tier, and on its summit.

In Scott's New Country the majority of the good land is already selected,—that which remains is chiefly to the south and south west: the occupation of this would be promoted by the construction of the road surveyed by Mr. Hall from Bonner's selection to Bridport,—the only expense necessary being for bridging a few creeks, and corduroying the soft places. Upon the north and west the unoccupied lands are barren and heathy, and composed of granite grit: upon the south east and south the scrub merges into second-class forest land of fair value: upon the south west there is a small area of basaltic land, which is as usual first-rate, and the country fringing the base of the Blue Sugar-loaf to some extent, and its flanks consist of heavily scrubbed land of moderate value. If these lands were isolated they might possibly remain unoccupied, but situated as they are with respect to the rapidly rising settlement of Scott's New Country they must soon attain value.

The finest land cannot be estimated at less than 2000 acres, and that of second-class value would probably amount to 5000 also. The amount of first-class land known to me at Ringarooma is about 16,000 acres (including sold and unsold land). The amount of second-class land may be estimated at 10,000 acres. A large area of fine land is also reported by Mr. Tully as existing to the north and east of that included in the present map. As bearing upon the hitherto unoccupied condition of the land at Ringarooma, I cannot refrain from quoting a passage written by Count Strzelecki more than twenty years since. He says:—"Those who sell a property should find means of rendering it accessible to those who buy it: they should, in good policy, render it accessible even to those who wish to examine it, whereby much valuable land would be disposed of which, for want only of the means of access, remains on the hands of the Government." The land at Ringarooma affords an apt illustration of the justice of this remark. A district capable of producing grain to the value (at a very low estimate) of £100,000 annually, or, if laid down in grass, of depasturing at the least 100,000 sheep, has remained for years unsold and unoccupied, although to some extent surveyed, and for a long time submitted for private selection or public competition; and this in the face of the land being of the finest quality, and on the whole so little encumbered with scrub, that the cost of clearing would not exceed one-half of that incurred in Scott's New Country. The deterring cause has been the impossibility of exporting produce, the only outlet being by means of a circuitous bush track, crossing the high range separating it from Scott's New Country, narrow, unlevelled, and unbridged, dangerous to horses and impassable for drays. As, however, the most desirable route of communication between the lands at Ringarooma and Scott's New Country will be made the subject of a special Report from Mr. Thomas, I feel it unnecessary to dwell further on this subject; but I would add, that as the natural outlet from the Southern part of the district appears to be to Bridport *via* Scott's New Country, so that of the Northern end is along Mr. Gordon Burgess's track towards Ringarooma. But, as this will be included in the next section of my map, I shall reserve my remarks upon *this portion of the district* until its completion.

I have the honor to remain,

Sir,

Your obedient Servant,

CHARLES GOULD.

*The Hon. the Colonial Secretary.*