Report on the Geology of Mt. Desert Island
(Topographic Sheet Nos. 1243 - v 1334 etc.
by J.N. Dana, Assistant)

Report by
J. Ensthofer
Aug 28, 1874

A cigar box with specimens is with the bottom specimen.

Original

This report was found with the specimens & filed by J.N. Dana.
C. P. Patterson

Supt of the U. S. Coast Survey

Sir,

According to agreement I started on the 3d and arrived on the 6th of this month at the place of my destination. At the first view which I gained over the grounds of the Island I found my supposition fully sustained, namely that the character of the configuration resembles that of alpine nature on a diminutive scale.

The enclosed stereographs, sketches and stamps of rocks will fully corroborate the same, and will conclusively prove not only this reconnaissance, but establish the necessity of a thorough geographical representation.

In as much as the amount of work has been even more than that of ordinary employment I beg leave to say, that the so-called "leave of absence" may be transformed into a "special duty," to examine certain questions on geographical conditions on
Desert Island.

I further enclose an example copy from the Planetable 1243 for comparison as would be desirable to be adopted in finishing field works.

My traveling expenses amounted to $115 which I beg to be reimbursed to me.

Very respectfully,

your obedient servant

J. Etholles

Washington, August 28th, 1874.
Enclousire No 1.

Report of an geographical reconnaissance of Mt. Desert Island.

In scaling the most prominent heights of the Island I have been unable to observe the geological structure, which I found of the following order. The base of the Island is of trap-rock. In such locations where this rock was less exposed to erosion it is metamorph, consequently we can judge that the foundation of the whole Island is of a basaltic nature.

The trap-rock circles the whole Island in heights of from 20 to 120 feet, upon this layer rises gray granite to about 100 to 300 feet and on the top of this rests the red granite. The crystallization of both granites outcropping the surface is very coarse and unfit for building purposes. The erosion in that latitude already most effective, producing in all precipitous locations slums (in Alpine language) on the Island called slide of a formidable size, and gradually filling up the small lakes.
The most interesting spectacle of the grim power of erosion can be observed at these points where the breakers find the greatest resistance. Here are found in abundance the so-called whirlpool stones, formed and polished to the most perfect ellipse; but what was of real interest was the discovery of the same whirlpool stones on the summit of Green Mountain, the highest point of the Island (see specimen No. 5, & 6.)

These specimens prove conclusively the gradual rising of the Island out of the ocean and further the fact that the top part of this mountain had to undergo at a certain time the same works of erosion as the present shores, this state of affairs is further proved by numerous rivers flowed around the summit, which can be transported higher only at a time, when this locality formed a ledge, on which it should deposit the stones,
For topographical purposes the investi-
gation of the geological structure may be
confined to the configuration of the sur-
face only, but to that extent a general
knowledge is indispensable. Without this
information no comprehensive under stand-
ing of the causal nexus can be formed.

I refer now to the tracings of plane-
tables No. 1334 a to c. The Sketching in
red ink indicates the rocky configuration
in its principle outlines & sufficiently
characteristic for the representation on
a reduced scale of 40,000, but in order to
show, how this object shall be treated on
the field-maps, I copied one of the most
conspicuous mountain parts located on
Sanctis sound. I further selected this
subject because it is at the same time
one of the best and minutest surveys of Mr
Down. A comparison of this example with
the planetable will however show at once,
that the latter is lacking to represent any
Distinct formation of the rocky structure on the more gentle slopes, it only marks the principle precipice and shows on the other side only dust, which shall indicate a rocky nature. This indistinguishness shows a want of artistic conception of forms. In referring to this deficiency, I do not mean to blame the individual engineer or draughtsman, but I do blame the authorities, which are destined to the office to construct Charts, Maps & plans in the best style and up to the standard of this branch of science and art. But shall this be achieved without any establishment for the proper instruction thereof? All European topographical Institutions are obliged to educate their engineers, draughtsmen, engravers themselves as it cannot be expected that the schools bring the scholars up to such a grade and perfection as is required for the practical service of such institutions.

I further have to allude to the representation of the configuration by equidistant curves only and without detail drawing of the
characteristic features of orography. This system is unquestionably the best system as long as it has to deal with gentle undulating terrain, but as soon as we attain to the higher mountainous regions, the system is insufficient without the assistance of topographical drawing. This is strikingly exposed in the late plane tables 1834 a. o. and in the Harbor chart of San-Francisco, where the perspective views of the entrance of the golden gate show that the declivities of the coast are composed of most formidable rocks, whereas the topographical representation of the same subject shows no indications of such a characteristic, they are hachured as if the surface of these mountains were covered with an alluvial ground.

I would not mention these discrepancies, if I did not know how to remedy the same, but what I have still more at heart, is to call the attention of the office towards preparatory steps for the
coming want of a perfect organisation to geographical corps, to the construction of which the U. S. Coast Survey is more or far than any other body.

In conclusion to the remarks on a more efficient system of topographical drawing upon the planetables I will also make some remarks on the representation of rocks.

The present literature and illustrations on topographical matters, having to the time failed to establish a systematical rule for this object. When engaged in the publication of my Topographical Atlas, I had commenced to collect materials and facts to that purpose, but finding the task rather difficult and too expensive for my purse, I laid the same aside, awaiting an opportunity for the completion thereof. This opportunity may be found now, provided the office orders to
lay down a system for the illustration of rocks. In order to treat upon this subject with perfect understanding, it becomes a necessity first to classify the rocks in regard to their principle formations.

Topographical illustrations and in particular such on small scales will never allow to represent at the same time also the mineralogical classification. All that the topographical engineer can achieve in this question, is conducted in a characteristic design for the contouring and system of hachuring indicating the declivity. In as much as the rocks will never be subject to a minute survey, therefore the illustration depends the more upon an artistic comprehension.

The classification of the different types will embrace the following characteristic representations viz.
1. The Wall, Pinnacle or Cliff - Form
2. Ridge
3. Terrace
4. Ripple
5. Boulders (Steinholde)
6. (Murrin)
7. Erratics
8. (Schmirr)
9. Ledges
10. Lava.

I propose herewith to collect such examples as will be necessary to the illustration of the above enumerated types, and when completed lay the same before the office for consideration and acceptance.
Practical results of the reconnaissance on Mt. Desert Island.

First. As the most important result of the reconnaissances are to be considered the sketches on the backs of the planchets 1394 a, b, c, and the corrections on the draft sheets, by the aid of it I will be enabled to complete those parts of the topography which have been left undistinct on the copy of said planchets. I must however state that I could not explore the whole area of the Island in as much as I found in many cases the obstructions so formidable that the same could not be surmounted without the assistance of a guide and proper equipment always necessary to scale such a terrain as is to be found in the sections of the U.S. Coast.

Secondly. By the results of this reconnaissance it is clearly established that the character of such a rocky configuration cannot find any satisfactory representation by horizontal curves only, but
that the surveyor must in such matters be conversant with the system of topographical drawing, or these characteristics have to be added by such a person who is perfectly familiar with the art of drawing and the natural conditions of such a terrain.

By the omission of this important and highly characteristic detail it is proved that examples and instructions have to be established as rules for the field engineers as well as for the draughtsmen and engravers.

In conclusion I offer my services as well to the necessary recommissionings as to the preparations of those formulars, essential to the latter point.

Respectfully
your

Assistant servant
J. Cathoffe