MAP
OF PART OF THE
Grecian Archipelago
to accompany
Lieut. Spratt's Memoir.

Drawn by J. H. King, William St. Swire.

Reeve Bro. Lith King William St. Strand.

these methods being communicated may suggest to others observations from which results of great interest may be derived.

A short additional paper was afterwards read from the same author, in which he stated, that after examining many exogenous trees from Portland island, he is satisfied that the sun's heat was as much above the internal heat at the time of the deposit of the beds of Portland oolite as it is now, the stems being similarly excentrical. He also thinks that the small thickness of the rings of these trees proves that the growth of vegetation was not formerly more rapid than it is now.

In conclusion, the author directs attention to the importance of accurately observing all instances of upright stems of trees that may be discovered *in situ*.

2. *Remarks on the Geology of the Island of Samos.*

By Lieut. SPRATT, R.N., F.G.S.

PLATES II. III.

THE island is divided into two equal parts by a high mountain running transversely across from the north to the south shore, and attaining a height of 4000 feet. The ancient as well as modern name of this range is Ampeloni.

Besides Mount Ampeloni, there are two other conspicuous mountains rising at the two extremes of the island. The western one, Mount Kerki, is the highest point in the island and is 4000 feet above the sea. The eastern mountain is the least in elevation of the three, and does not exceed 1200 feet. Mounts Kerki and Ampeloni are composed of a mass of crystalline limestone overlying mica schists, but whether conformably I had no opportunity of observing; neither can I speak of the amount and direction of the dip of these older rocks; in Mount Kerki however the dip was considerable, whilst in Ampeloni and the eastern mountain it is not great; in the latter indeed the strata are nearly horizontal, so that the schistose rocks do not appear at all.

These mountains are connected together by a series of flat-topped hills and ridges from 400 to 800 feet in height. The deposits forming these are all of freshwater origin, and appear by their fossils to be identical with the lacustrine formations on the shores of the Gulf of Smyrna and the island of Scio, which have been described on a former occasion, and are supposed to be of eocene date.

The portion of the island of Samos described in this paper, the only part I had an opportunity of examining closely, is the district lying to the east of Ampeloni between Port Vathy on the north, and the site of the ancient city of Samos on the south side of the island.

The accompanying section is on a line between these points, where
VOL. III.—PART I. F

the inclined strata represent the lacustrine deposits, consisting of thick beds of a white compact limestone, not easily distinguished in mineral character from some of the secondary limestones containing Nummulites which occur in the southern part of Asia Minor.

SECTION 1. From PORT VATHY to the ancient city of SAMOS.

The lower deposits of this formation are the most compact and thick-bedded; but the upper portion of the series is more thinly stratified than the former, and occasionally interstratified with white and grey marls. The thickness of the whole deposit exceeds 1000 feet; but as the formation upon which it reposes is nowhere visible, its entire thickness is not seen.

Fossils occur in several localities, but not in any great abundance or in a very good state of preservation, the cast only of the shells remaining. Vegetable impressions are more abundant, and appear to have been made of plants which grew at the bottom of the lake. A species of reed often occurs in clusters like a number of cylindrical pipes, the cavities formed by the imbedded reeds not having been filled by calcareous matter after their decomposition. They are nearly always found in a vertical position.

The localities at which I found these reeds are (1) the western shore of Port Vathy; (2) cliffs at the ruins of the ancient city of Samos; and (3) on the summit of the ridge about two miles north-east of the large village of Mitelinious, where also, besides the casts of the reeds, there are abundant impressions of stems with leaves attached.

The longest of these stems with attached leaves was 18 inches, and the diameter of the reeds $1\frac{1}{2}$ inch. Both kinds of vegetable remains are fossilized in a vertical position, as if imbedded in the deposited sediment whilst growing at the bottom of the lake. The strata in which they are found are exceedingly hard, owing to the presence of siliceous matter. With these plants I found a single specimen of a *Planorbis*, which seems to be *Planorbis rotundatus*, very abundant in the freshwater deposits in the Gulf of Smyrna. The other shells are a *Paludina* and a *Melania*, both procured from the south face of the hill upon which stands the Acropolis of the ancient city of Samos. The *Melania* is also found on the hills bordering the west shore of Port Vathy. From the promontory on the east side of the ancient port I procured several specimens of *Helix*. They are associated with casts of a *Lymneus*, identical with that found in the lacustrine beds of the Gulf of Smyrna, and therefore identifying this formation as a portion of the bed of the great eocene lake which doubtless formerly extended over the area now occupied by the Ægean Sea.

I have now to notice another formation of a subsequent date, but whose origin is uncertain, from the absence of fossils by which to iden-

1846.] SPRATT ON THE GEOLOGY OF EUBŒA AND BŒOTIA. 67

tify it. This formation reposes horizontally upon the lower beds of freshwater origin in the neighbourhood of the village of Mitelinious. A deep water-course from Mount Ampeloni cuts through these deposits, and exposes sections of the different strata, consisting of about 150 feet of brownish and grey beds of sandy marl, sandstone, grit, and gravel containing pebbles of the rocks older than the lacustrine deposits.

From the absence of fossils I can only offer a conjecture with regard to their origin, which I think to be marine. Deposits corresponding to these will however be more fully described in the next paper, on a part of Eubœa and Bœotia.

3. *On the GEOLOGY of a part of EUBŒA AND BŒOTIA.*
By LIEUT. SPRATT, R.N., F.G.S.

PLATE IV*.

SINCE my examination of the freshwater deposits on the east coast of the Ægean sea and in the island of Samos, I have been enabled to pursue some geological researches on its western shores; and there, as I had expected, I found corresponding formations in several localities, establishing the fact of a great eocene lake having extended over the whole of the Grecian Archipelago, where now there is a sea which in many places is known to be more than 300 fathoms deep.

I shall first briefly notice the distribution of the older rocks in the Negropont. The southern part of the island is composed of gneiss, mica schist, chlorite and crystalline marble, elevated into very high ridges, and forming a very mountainous tract of country, the highest peak of which is Mount Elias, near its south extremity. It attains a height of 5000 feet. The formations dip in various directions and at all angles; generally the dip is either to the N.W. or S.E., and the angle not exceeding 25° .

The marble was extensively quarried by the ancients; numerous deserted quarries exist along a range of coast fifteen miles in length, in which columns and blocks of various sizes are still lying ready for transportation, and some exceed thirty feet in length. The marble is the Cipollino of the Italians, and these quarries seem to have been the chief source which supplied Rome for many of its buildings.

N.W. SECTION 2. Mount OLYMPOS to the neighbourhood of ALIVERI.
Mt. Olympos.

These older rocks terminate at Aliveri, and are succeeded by secondary rocks, composed of dark shales and limestone, containing

* The geographical map Plate 2 exhibits the relative position of Samos, Eubœa, Bœotia and Smyrna.