

the trachyte being stratified like that found near Smyrna. The tertiary hills on the margin of the Scio channel, near the town of Tchesmeh, and in the island of Scio opposite to it, seem also to be of fresh-water origin, as they closely resemble those of the Gulf of Smyrna.

The facts made out from these investigations tend to prove the former existence of a large lake in the eastern part of the Archipelago, where the sea now attains a very considerable depth*, and that subsequently a succession of volcanic eruptions on a grand scale took place over the bed of the lake. A long period of tranquillity must, however, have preceded these eruptions, during which 500 or 600 feet of a vertical series of beds had been deposited throughout the lake. By this sudden outburst of igneous matter, parts of the deposit were raised into hills of considerable elevation, whilst the accumulations of the heated and melted fluids poured over the bottom, formed mountains and high ridges of considerable extent round each focus of eruption. In the tertiary hills there is evidence of a denuding power at elevations above the present sea level.

Having carried this ancient lake into the depths of the Archipelago, the question then arises as to its former boundary, a question which extended observations only can determine.

2. *Note on the FOSSILS collected by Lieut. SPRATT in the Fresh-water Tertiary Formation of the GULF of SMYRNA.* By Professor EDWARD FORBES, F. L. S.

LIEUTENANT SPRATT has found eleven species of fresh-water shells (all univalves) and a cast, apparently of a *Helix*, in the fresh-water limestone of Vourla.

Of these, two belong to the genus *Limneus*, one of which agrees with the *Limneus longiscatus* of the Paris basin and the Isle of Wight fresh-water bed, and the other is apparently the *Limneus ventricosus* of Brongniart; also a Paris basin shell.

Five species belong to the genus *Planorbis*. One of these is *Planorbis rotundatus*, a well-known eocene fresh-water fossil. Three are closely allied to, if not identical with, Paris basin fossils, and one is new.

Two belong to the genus *Paludina*. One of these appears to be the *Paludina atomus* of the Paris basin. The other is new.

One belongs to the genus *Melanopsis*. It is the *Melanopsis buccinoidea*, a species which, commencing its range in the oldest tertiary strata, has lived on to the present day, and is now a common inhabitant of western Asia, northern Africa, and the southern parts of Europe.

* At about five miles off the north extremity of Karabournou the depth is 100 fathoms, and continues to increase beyond.

One belongs to the genus *Melania*, and appears to be a new form.

On the whole, the evidence afforded by the fossils tends to show that the great fresh-water formation which skirts the Gulf of Smyrna and the coasts of many islands in the neighbouring portion of the Archipelago is of the age of the Paris basin and London clay. Whether the fresh-water tertiary basins of the interior of Asia Minor and of the valley of the Xanthus, and the islands of Cos and Rhodes, are of the same age, is very doubtful. Judging from the numerous fossils collected by Mr. Spratt and myself in those tertiaries, I am inclined to pronounce them of a different age and of later origin; anterior, however, to the pliocene marine formations of Asia Minor and the Sporades.

I may add that Mr. Strickland, in his Memoir on the Geology of Smyrna, mentions a *Unio*, a *Cyclas*, a *Helix*, and a *Cypris* in the tertiaries of Bournabat which have not been met with by Lieutenant Spratt.

Impressions of the leaves of vegetables, too imperfect for determination, accompany the specimens laid before the Society.

List of the Fossils.



- a.* *Planorbis Spratti* *E. Forbes.*
b. *Paludina Stricklandiana* *E. Forbes.*
c. *Melania Hamiltoniana* *E. Forbes.*

1. *Limneus longiscatus* Brongniart.
Many casts, not distinguishable from French and English examples.
2. *Limneus ventricosus* Brongniart?
The specimens closely resemble the recent *L. auricularius*. The spire appears rather shorter than it is represented in the figures of the French fossil, to which I have referred it.
3. *Planorbis rotundatus* Brong.
Such specimens as retain the shell exhibit transverse sulcations of growth.
4. *Planorbis cornu* Brong.?
Specimens with the shell are spirally striated, like the recent *Planorbis similis*. Not having compared it with authentic French examples, I have marked this species with a query, though it closely agrees with the figures.
5. *Planorbis prevostinus* Brong.?
Too imperfect a specimen for certain identification.
6. *Planorbis planulatus* Desh.?
The inner whorls do not occupy so much space as they are represented to do in the French figures. It is closely allied to the recent *Planorbis nitidus*.
7. *Planorbis Spratti*, nov. sp. (woodcut, fig. *a*).

P. testâ discoideâ (lævigatâ), superne planâ, inferne profunde umbilicatâ; anfractibus crassis, superne angustis, quinis, subangulatis.

Lat. $\frac{7}{8}$. Crass. $\frac{1}{10}$ unc.

Closely resembling the recent *Planorbis contortus*, which represents this species in miniature. It is allied to the *Planorbis cylindricus* of Sowerby, from the fresh-water tertiaries of the Isle of Wight, but differs in the greater number of whorls, and their narrowness on the upper disk, which is very slightly concave.

8. *Paludina atomus* Brong.

A little *Paludina*, which appears to be identical with the Paris basin shell described by Brongniart under the name of *Bulimus atomus*, and rightly referred by Deshayes to the genus *Paludina*.

9. *Paludina Stricklandiana*, nov. sp. (woodcut, fig. b).

P. testâ globulosâ, lævigatâ, politâ, umbilicatâ; spirâ depressâ, obtusâ; anfractibus 3—4; aperturâ ovatâ, superne angulatâ, marginibus crassis.

Lon. $\frac{1}{10}$ unc.

A very minute but beautiful and distinct species, in form somewhat approaching *Ampullaria*. Its nearest ally is the *Paludina globulus* of Deshayes, a Paris basin shell, which is, however, imperforate, and not nearly so globose as the Asiatic species.

10. *Melanopsis buccinoidea* Auct.

A single specimen from the burying-ground in the island of Vourla.

11. *Melania Hamiltoniana*, nov. sp. (woodcut, fig. c).

M. testâ ovato-turritâ, anfractibus septem, lævigatis, longitudinaliter multo-costatis, costis subsinuatis.

Lon. $\frac{1}{4}$ unc.

Apparently a very fragile shell, of which usually only the impressions remain. In sculpture it bears a close resemblance to a marine *Chemnitzia*.

3. *On the Remains of FISHES found by MR. KAYE and MR. CUNLIFFE, in the PONDICHERY BEDS. By SIR PHILIP DE MALPAS GREY EGERTON, M. P.*

THE fish remains collected by Mr. Kaye and Mr. Cunliffe in the neighbourhood of Pondicherry having been placed in my hands for examination, I have endeavoured to discharge the task committed to me to the best of my ability, by comparing the Indian fossils with analogous forms from other localities, and with the figures and descriptions given by Agassiz in the "Poissons Fossiles." The collection consists wholly of teeth; they are, generally speaking, in bad condition, few of the placoid teeth retaining their bases, a very essential element in the identification and description of species. Before proceeding to detail the characters of the several specimens, it may be advisable briefly to relate the results at which I have arrived from the study of these ichthyolites. With the exception of two specimens, the collection is entirely composed of teeth of squaloid fishes. Of these two exceptions one belongs to the Ganoid order and to the family of *Pycnodonts*, and it is probably a *Sphærodus*; the other is referred to the Cycloid genus *Enchodus*, the teeth very closely resembling those of *Enchodus*