Posilipo. In the late 1920's de Lorenzo was advising on the excavations under way on the site of the Temples of Paestum. In a paper appearing in the *Rend. Acc. Lincei* of 1930[1], de Lorenzo quoted a passage from Gunther's *Geographical Journal* paper of 1903[2] accounting for the desertion of the Temples site. de Lorenzo illustrated this by a diagram suggesting that the plain on which the Temples stood had fallen to a maximum in the Middle Ages, and had risen to approximately their present height in the eighteenth century. During that period the Temples were described as having been surrounded by swamp, due to the silting up of the River Sele (Salso), and the structures themselves lost in vegetation.

In October 1963, I, being engaged on a life of Robert T. Gunther, made a tour of the Calabrian Coast to visit the ground my father had worked in 1907. The tour ended with a visit to the Temples of Paestum in search of some indication of the levels traceable in the south. On the cliff at Agropoli, for example, which Robert Gunther had not visited, there are clear levels at 11, 20 and 60 ft. above present sea-level. The visit to the Temples yielded evidence, clearly not available to de Lorenzo, of the boring of the marine mollusk *Lithodomus* in the columns of all three Temples up to a maximum height of 5 ft. above their floors. These observations were confirmed by the more frequent borings in the travertine blocks at lower levels throughout the site. The ground on which the Temples stand is 16 m (52 ft.) above sea-level. The highest borings are about 9 ft. above this, say 61 ft. (18·5 m) above sea-level. At the Porta di Sirena, near the station, borings were found at about ground-level (18 m) and the sea at its highest must have flowed through the gate. The submersion of the Temples of Paestum to about a fifth of their height, due to the fall of the land, can well account for the gap in historical records extending from the eleventh to the eighteenth centuries. In the Bay of Naples the land has some 16 ft. still to rise before it reaches Roman level. If this is also true of the Plain of Paestum, then the Temples have sunk 76 ft., and risen 61 ft.

Various marine erosional levels are traceable at many points along the Italian coast and these extend from Calabria through Sicily and to Malta. But that the 60-ft. (18-m) level is a historical one raises some broad questions. These it is hoped may be answered by a continuation of the present work.

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Thermal Metamorphism of Beacon Group Sandstone of the Taylor Valley, Antarctica

EARLY in 1963 members of the sixth Victoria University of Wellington Antarctic Expedition mapped the geology of the Taylor Valley, an ice-free valley which enters McMurdo Sound 45 miles west-north-west of Scott Base, Antarctica.

The rocks of the Valley are early Palæozoic or Pre-cambrian granites and gneisses, unconformably overlain by Beacon Group[1] sediments consisting of a thin conglomerate and 3,000 ft. of Beacon Heights orthoquartzite[2]. Both igneous and sedimentary rocks are intruded by sills of Ferrar dolerite[1]. One sill is characteristically intruded along the unconformity. In the Taylor Valley region this sill, about 1,000 ft. thick, locally rises above the unconformity and blocks of sandstone are isolated between the dolerite and the basement rocks.

One of these blocks, about 800 ft. across and 230 ft. thick, is exposed near Round Mountain (77° 40′ S., 161° 5′ E.). It consists of medium to coarse grained quartz sandstone, but in contrast to the normal white or buff colour of the Beacon Heights orthoquartzite the beds for 200 ft. below the contact with the dolerite sill vary between white and dark green in colour. Samples of all colours were collected and examined petrographically and by X-ray powder spectrograph. The green coloration was found to be due to the presence of secondary chlorite. Chlorite, with muscovite and biotite, formed in the interstices after deposition of authigenic quartz around the sand grains.

X-ray spectrographs of the chlorite show a distinct 14 Å peak, a characteristic of the *sensu stricto* chlorites of Nelson and Roy[3]. Measurement of the refractive index and birefringence of the chlorites indicates that they vary between brunsvigite and ripidolite (after Hey[4]). Nelson and Roy[3] put the minimum temperature for the formation of *sensu stricto* chlorites at about 350° C and note that they are unstable above 700° C. Although these values are from experimental work on the system $MgO–Al_2O_3–SiO_2$, the values of temperatures of formation and instability of the iron-rich brunsvigite and ripidolite are probably of the same order as for the magnesium chlorites.

X-ray spectrographs were made of chlorites concentrated from sediments of two other green-coloured formations of the Beacon Group. These chlorites do not have the distinctive 14 Å peak, the first being at 7 Å, and the minerals are septe-chlorites[3] which probably formed as sedimentary chlorites.

The chlorite of the sandstone lens near Round Mountain was almost certainly caused by thermal metamorphism of the fine grained matrix of the sandstone by the hot intrusion of the Ferrar dolerite[6]. The temperatures involved, 350°–700° C, are consistent with Jaeger's[5] theoretical values for heat distribution in the neighbourhood of cooling intrusive sheets.

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PHYSICS

Influence of Magnetic Fields and X-rays on the Etching of Quartz

IT has been shown[1–3] that the application of a strong varying electric field (alternating, pulsating), but not a steady d.c. one, normally on a quartz plate during etching by hydrofluoric acid, results in the formation of two kinds of etch-figures, namely, the ordinary microscopic etch-pits (or hills), and the so-called electric figures of sizes visible to the naked eye, the latter being composed of fissure-like lines. It also has been demonstrated that the orientations of the electric figures produced on the three principal sections of quartz are useful for axes determination, and that certain crystal defects, undetectable by the conventional method of etching, can be easily located by the distribution of these figures.

In an earlier communication[4], it was pointed out that the joint action of intense ultra-violet radiation and hydrofluoric acid on a surface of Z-cut quartz plate causes a marked flattening and change of orientation of the well-known pyramidal etch-figures, and also a striking increase in the rate of surface dissolution. In the case of X-cut and Y-cut plates, no structural change in the etch-pits has been observed; the irradiated etched portion and the adjoining non-irradiated etched portion of a surface can