Observations,
connected with
the
Natural History & Climate,
of the
ISLAND of MADEIRA
by
Alexander Haller,
candidate for the Degree of
Doctor of Medicine,
in
The University of Edinburgh.
1844
The following observations, are chiefly, from notes taken during a short residence in the Island of Madeira, during the winter of 1839-40.

My principal sources of information on the geology of the island, were two papers published in a Madeira Newspaper, called, The "Flora d'Ocean", the one by Capt. Mauvisbe d'Albuquerque, formerly Governor of the Island, the other by Mr. Smith of St. John's Hill, who kindly gave me permission to make what use I liked of his paper. I have translated these two tracts, with considerable alterations, however, in consequence of several new points having been lately made out.

For the remaining subjects, I have chiefly consulted the following works—

3. "A Guide to Madeira, containing a short account of Funchal, with instructions to such as repair to that island for health"—Campbell. London 1801.
The Madeira Islands

The Madeira Islands form a small cluster in the Northern Atlantic Ocean, extending between 32° 25' and 33° 5' North Latitude, and between 16° 15' and 17° 26' of Longitude, West from Greenwich; being about 350 miles distant West from Cape Canton on the Mozam-Be Coast, the nearest part of Africa, about 250 miles North by East from the Island of Teneriffe, and 300 miles North from the Island of Tenerife. Their situation therefore, is to the Southward of any part of the European Continent, or of the Mediterranean Sea; nearly 10 Degrees North of the Tropic of Cancer, and 3° W. beyond the Northern limit of the Trade Winds, which however affect them slightly.

The archipelago consists of 2 considerable Islands viz. Madeira & Porto Santo, and of 3 much smaller and unimportant ones, called from their barrenness "Desert.

Of the 2 principal islands - Madeira - is considerably the larger and more important. Its Eastern Extremity, Point St. Lourenco lies in 32° 3' 30" N, D. 16° 39' 22" W. Its Western Extremity, Ponta de Prego in 32° 55' N. D. 17° 22' W. being to the Westward of the other islands, seventeen leagues South West from Porto Santo. Its greatest length...
From East to West, is about 40 miles, and its greatest breadth from North to South, is about 14 miles. The Circumference is about 110 miles, and its area is estimated at 360 square miles.

The shape of the island is somewhat that of an irregular Quadrangle, tapering off at the East end to a narrow tongue of land, called Point St. Lourenzo, which is about 7 miles in length. At about 14 or 15 miles from the extremity of this Point, the Island attains its maximum breadth of about 14 miles, between Point St. Jorge in the North and Cabo de Garcia on the South side, in the direction North North West. It then gradually narrows again, so as to be about 9 or 10 miles in width, and continues at about this width to the West ends of the Island, which is about eight miles broad.

As to the general direction of the Island, the West End with the Western half of the Island, marked off by an imaginary division drawn between Sete-Centos in the North and Redeiro Bravio on the South side, or better by the natural division of the Valley of Sete-Centos and the temple of Azogui, is WNW, gradually as it nears the Western extremity, turning more to the Northward; this half of the Island is of a smooth \[\text{width}\]
Madeira

width throughout, rijg about 8 or 9 miles, so that the direction
West End of the island, between Ponta de Britam
on the North and Ponta de Pargo on the South side
does not taper as does the East End, but terminates
abruptly about 7 miles in width. The other
or Eastern half of the island gradually widens
about an average of 13 miles, till it reaches its max-
imum breadth of about 14 miles between Phil. Bay
on the North and Cabo de Garajao (Hog Gulf Cape
named by the British) Brazen Head from its colour)
on the South side of the island; this line of Max-
imum width is about 15 miles from the extremity
of St. Lawrence, and the island rapidly narrows
from it till it reaches the Village of Canical, where St.
Lawrence may be considered to commence, then
the land is about 25 miles wide, and gradually
narrows and becomes very irregular to the extremity.

But to be more specific, starting from the
South West Point, called "Ponta de Pargo", the South-
ern Coast of the Island runs to the SE till it reach-
es "Ponta de Jardim" (a distance of about 8 miles)
preventing along this extent a few small coves, near
the shores. From Ponta de Jardim the Coast runs
ES to "Ponta de Sol", and thence to "Ponto da Cruz"
Madeira

The southernmost Point of the Island, the general direction, not to notice the minor bends, is E by S. From Ponto da Cruz to Cabo de Garajau (which lies in the Bay of Funchal, the chief town of the Island) the direction is about E by N; hence to Ponto de Oliveira it is ENE, and from the latter to Calheta at the commencement of Ponta de St. Lawrence NW by N. Now starting again from Ponto de Pargo, and taking the Northern Coast, we find it runs NE to "Ponta de Ristam", where the Northern exposure of the Island begins; from this it runs about ESE as far as St. Vicente, taking then the direction ENE till Ponta de St. Lourenço, running SE to Ponto de Cruz, and to the origin of Ponta de St. Lourenço the direction of which is due E along its whole extent.

The whole Island is very precipitous, hilly from Coast to Coast, the slopes of the bottom, being very sudden, hilly for them. The Coast is very deep, and is clear of Rocks or Reefs along its whole extent with a few exceptions. 1st. At the NW extremity of the Island, at "Ponto Rocks" Broniz" and "Ribeira de Samella", there are several broken and incisedl rocks, one of which is named the "Roca Molli". 2nd. At Ponto de Pargo there exist...
Madeira  
a sunken rock on which the sea breaks strongly, 
forcing the Country Boats to keep considerably out 
to sea, in order to double it. — 3° 28' west of Madeira. 
This Rock called "Gurgulhe," and sunken Rock 
"Varnice," with the "Baias Larga," and fortified "Los 
Rocks" or "Ilheus" in the immediate vicinity of Funchal, 
are lastly at the extremity of Pt. St. Lawrence, there are 
many rocks visible above the water, and not a few 
sunken ones. All these Rocks however are within 
about 3/4 of a mile of the shore, and are therefore of 
no material danger to shipping.

In its general configuration the Island consists of a 
Map of Mountains of considerable height, often ter- 
nminating so abruptly on the Coast, that the Level 
seems in many places are 1000 or 1200 feet high. The general 
height of the Mountains is about 4500 feet above the sea. 
In the Centre of the Eastern Half before mentioned, 
are the loftiest Peaks of Madeira, — viz. — Pico Ruivo, 
Torres, Arrieiras, Grandes, Canarias, &c. &c.; 
three ridges are rivered and separated by Ravines of 
considerable depth, at the bottom of which run the 
small streams, which irrigate the Island, being dry 
or nearly dry water courses in summer, but in winter 
sometimes swelling to dreadful Torrents, that turn
all before them, carrying Rocks, land, Vineyards, Houses & even people, heading to the Sea. From these summits, which are mostly clothed with a delicious verdure, the land slopes Northward & Southward, but most abruptly towards the North, where for the most part it ends in high precipices, whose bases are washed by the ever calling Atlantic, thus, affording no shelter for vessels, Peace, landing place, and for Boats and two Ports of Refuge from its inconstant Surge, viz. Porto de Cruz & Porto Moniz... On the South side there are headlands which every surpass in precipitancy and grandeur, those of the North, but there are fewer of them; we may instance "Cabo Girão" as one of the most remarkable headlands in the World, being about 1700 feet in height, perpendicular, above the level of the Sea which washes it hard.

The loftiest point of Madeira is the Summit of "Pico Ruivo". According to Bowdich (Excursions in Madeira & Porto Santo, p. 47) the height of Ruivo, above the level of the Sea, as measured by the Barometer, is 6,164 feet; and according to a Trigonometrical Calculation 6,303 feet; now if we take the mean of these two we find it to be 6,233 feet, which exceedingly nearly...
Madeira

agrees with the height of the Peak, as given by Lieut. Peck, and was made very careful
observations on the subject in 1838, and gives the height of Aruia as 6,237 feet, or only 47 feet more than the
mean of Bowdich's heights. The other Peaks are
from 5,980 to 904 feet lower than Aruia.

There is very little level ground on the Island. In the Eastern Half before mentioned, there is an
upland plain to the southward of the highest Peak, at an elevation of about 3,000 ft., called by the
Natives the "Serra de St. Antonio," covered with the
Tree Heath (Erica arborea) and a large kind of
Blackberry (Vaccinium Madeirense) and some other
shrubs, and affording the chief shelter for game,
such as sparrows, woodcocks &c., which however are
very scarce. In the other half of the Island, the
West of St. Vincent & Ribeira Brava, the Mountains
are not cliffs to such an extent as in the East Half;
but terminating abruptly at a height of about
5,000 feet, form the large Table-land similar to that of St. Antonio, called the "Paul de Serra" or "Campur
Grande," it is about 9 miles in length and from
3 to 4 in width, "a wild, uncultivated, uninhabited half-
enually veiled in mists and clouds." Its height is 3,153 ft.
Madera

The aspect of the Northern Coast, is Magnificently grand & vast and wild; the huge dark pinnacles, standing out in the Atlantic and being its surges, crowned with the verdure of vine-propping evergreens, backed and arched and were supported by Mountains whose summits are intercepted from view by a zone of clouds, heightening it appearance, the distant pinnacled Fractals which sent them or small contracting in the distance, with the humble town appearance of the boat, and the verdure in the foreground, the whole enriched by the brilliant lights of an almost tropical scene, present a view far beyond description or the powers of the Artist. These Pinnacles are level or in the level of the sea by Ravines at the bottom of which lie the channels of the Mountain Streams, which from their declivity seldom contain much water. The principal of these Streams are those of "Porto da Cruz", "Fajal", "Dr. Jorge", "St. Vincent", "Porto Delgada", "Santo" "Vila Franca". A small village is usually built at their mouth.

The declivity towards the South, as we have already stated, is more gradual than on the North Coast, the Sea-cliffs being for the most part low, and less precipitous, but there are exceptions to this general remark (e.g. Caba Franca) for in some places the steps of...
Madeira

The Central Mountains is so gradual, that they in a great measure retain their height to the coast, thus exhibiting precipices of no mean altitudes between Ilha de Marins and Semicircular Bays, such as those of Funchal (the Port of the Island), Ilha de Lobos, between Cabeira Grand and Cabe Sarajao, as also those of "Dal Teini" and "Ponta do Machico". For the same cause, the streams running towards the south are longer and more sinuous, than those proceeding northwards. The southern coast also has more bays and landing places, and being sheltered by the general winds of the island from the prevailing NW and NW winds, ships and boats here find security and ease which is denied them on the North Coast. The sea in general being very calm. Thus in the Bay of Funchal situated between Cabe de Sarajao and Ponta do Cruiz, vessels of any burthen can anchor (if necessary with a quarter of a mile of the shore) in perfect quiet and security against all winds, excepting those between the points SW and SE by E. From the sudden cultivation of the Coast, there are very few Beaches on the Island and those that do exist are small and formed entirely of black shingle of various sizes, and almost entirely destitute of fine grain ; sand.
Madera

being but one exception in Madeira, viz. at Câmara Beach on Ponta do Lawrence, where there is a small beach of key of fine-grained yellow sand; similar to that found at Porto Santo. On the south side of the island, as on the North, slender streams are the main streams lodged in deep ravines, which the nearly quinquennial rain, receive in the Winter or Rainy season. Considerable quantities of water, their volume being increased by the holders and earth, which their rapid descent, empowers them to drag along with them, and thus become. being torrents of prodigious power, they frequently cause very considerable damage to the property in their near vicinity, and have even carried away houses and people into the sea. The principal of these Waters are those of Maderia, St. Cruz, Porto Novo, Caniço, Funchal, and the towns of Câmara, Funchal (St. Peter, St. João, St. Gonçalo). The aérea das Isorides, to the East of Câmara de Lobos, the largest in Madeira, rising in the Foceinas and passing through the Canal das Feiras (Funchal) one of the most magnificent valleys in the island. Aérea Brava, A. de Itálusa, those of Pont de Sol, Magdalena, Pelhés, and Marinheiros. The Banks of these streams are the most fertile and picturesque spots in the island, contract well with the grand but barren wildness of
Madeira

The Coast, the sides of the Mountains at the bottom of which they lie, are covered with luxuriant verdure, composed of "Fó, Vinkatec" Laurels, Chestnuts, and Plants of all kinds, giving an exquisite richness to the whole scenery, the combination of which is truly magnificent. The views of Curved cannot be very extensive, but they are very varied, wild, and grand, amongst these well worthy of being visited are the Ascend, Portello, "Circumisid" Terra d'Ag, and Valley of S. Vicente, Porto da Cruz, with the Eagle Rock, St. Anna, "Piliscence" Fei. 90.

There are several small falls of water about this land and one called, far excellined, the Waterfall not far from Tunchal, is about 300 feet in height, but there is a break after the first 100 feet or so.

At the head of the Island, in the Paul, there are some remarkable waterwoks called the "Rafael," which a Watercourse has been leaded out of the gold rock at a great height. It is well represented in the beautiful work called "Madeira Illustrated" by Dr. D. Macanlay, together with other views of the most interesting parts of the Island.

Having now given a general view of the Island, I proceed to its Natural History, Ecology.
Madeira

Geology. In attempting a description of the Geology of the Island of Madeira, I felt considerable difficulty in the task, but trusting to the indulgence of those to whom I have the high honour of submitting my Thesis, I propose to follow out my Project, by imagining myself just arrived at the Island, taking a look or two around me, landing, viewing and examining the various objects as I come to them, and then from my Notes thus gathered, form a Classification of the subject and endeavour to draw Conclusions as to the probable origin and age of the Island; at the same time I beg to be allowed to state, that my propositions are made with the greatest deference, and no one can be more conscious of their infirmity than I am myself.

The Geologist just arrived in the Bay of Funchal and approaching the Tower, is at once struck with several points in the scenery before him, clearly indicating that the Island is of Ignous origin—In his left there are the peculiar sugar-loaf hills, so characteristic of a Volcanic Country; he lands at the "Portinha," and treads on volcanic soil, some parts of which appear as if they had but recently been
Madeira

been exposed to igneous action, as he walks on the geology
see, more discolored, fumice, lava, and Basalt forming
the cliffs, which have been broken away by
the force of the sea, all exhibiting marks of hav-
ing been subjected to the same great power, and
as he proceeds, he is struck with the predominance
of Rocks of Basaltic Formation, in which Compact
Basalt is seen alternating with Conglomerate of
Basaltic formation, mixed with blocks of Pyrope
rocks of all shapes and sizes, more or less uniform
more or less compact — he is at once convinced
that the Island is VOLCANIC.

The greater part of the Basalt, is found in stages Basalt
of various thickness, usually divided irregularly by
figures running almost vertically, sometimes how-
ever, the best divides itself into regular polygonal
prisms (4, 5, 6 sided).

The Columnar Basalt is generally of a compact
nearly homogeneous structure, with a broad con-
chordal fracture, splitting in horizontal laminae,
or at right angles to the prism; dark grey and
coloured within, or on the surface of a fresh fracture
but which in time becomes covered with a superficial
decomposing crust of brownish yellow, fading ult.
Maderia

Matters into dull brown and yellowish white, the part thus decomposed being very brittle; it is generally without well defined or distinguishable crystals: the specific gravity is about 2.9.

This compact Basalt is known by the name of "Pérola Cristalina" or "Blue Jaspe," and "Blue Limestone" by the natives.

Although the Mass of the Basalt is usually amorphous, it is sometimes crystalline; thus, distinct crystals of Olivine, (Peridot, diamond. "Kaigel."

The crystals of the Basalt are frequently to be met with, and are also found in Brittle Laminelle; as pulverulent and altered. Well marked crystals of Hornblende are occasionally to be found in the Maderia Basalt, particularly above the Village of Canical; while the Basalt is almost entirely formed of crystals of Hornblende (Amphibolite Kaigel) and Olívine. Crystals of Porphyritic Forlite, (Meloy) occur in the cavity of the Basalt, and not unfrequently crystallized Porphyritic Limestone, (Eurazolite) either melanolitic or crystallized in needles, as flint, and known that it is difficult to ascertain to what variety they belong. (E. DE) In one locality at Costa de Lou, pieces and chondrite iron ore (Ter Chryse Kaigel) occur in abundance.
Madeira

abundance together with Aragonite. In two or three localities, (Campinas, Machico, Pestana) crystals of Iron pyrites are found, embedded in Basalt (A). This Sulphure is uncommon; Chalcyrite springs exist at the two former localities.

In the Jardins des Plantes, there is a specimen of 'Pombe natif volcanique,' amorphous, in masses cantouronies, of Mr. Bailey, found in Madeira in the Basalt to the Westward of Funchal; but not a vestige of it is to be met with in these rocks at present, and we would be inclined to doubt the authenticity of the specimen, had Galina not been found in the Basalt near Seixal. (7)

At the lower part of the Strata, the Basalt occurs almost always more or less poriaceous or spongy and in the vertical fissures the surface of contact of the separated masses is usually found altered and coated with a reddish film containing a considerable quantity of Feroxydes of Iron.

The Basalt is frequently observed in the form of Dykes and Veins, not only traversing the successions of Conglomerates, but also the intermediate strata of Basalt (particularly well seen at Calo Gomacai and Calo Giam). The Basalt of these Dykes is al-
Madeira

almost invariably, divided into lamina by
planes parallel to the surface of the dyke, and
their structure is different from that of the Stati-

cal Basalt. The Specific Gravity is also less, being
2.7 instead of 2.9.

Most of the Basalt is as hard as the granite un-
workable, in some localities however, as for instance
in the neighbourhood of Camara de Lobos, it is re-
culated, with numerous small pores, and the stone
is softer, and of a finer texture, fitted for the use of
the Mason; it is known by the name of Caniside
igneous (Toothed Tuffstone). It is principally used
for the Quarries of Walls, stairs, lintels, bell, &c.,[1]
and for the mill stones and ma-
ufacture of

Sometimes the particles of this vesicu-
lar Basalt, are elongated in the direction of the
current of lava, & flattened by the action of gravity.

This kind of Basalt is commonly known by the name
of "Chavadi Fardhi, and from it Mill stones are ma-
ufactured.

When the lava is exposed to the external air, it
becomes vesicular, like the crags of an ice foundry,
and the superior and inferior surfaces of the Vesi-
cules, and the whole mass of the stone, are thus
vesicular (as in Crags to the West of the Ponta de)
Madeira

In the neighbourhood of the "Mauá" and "Pica-piche", there is a soft, moist, red, light and coloured Basalt, sometimes in chalcedonic masses, sometimes in globular lumps, separating into concentric layers. It appears to be ordinary Basalt, altered by the action of gases and rain. It is well worthy of notice however, that it exists, interposed between compact hard rocks, without the least vestige of alteration...as if there had been a particular period of formation.

Basaltic Conglomerate continually alternating with stratified Basalt, and traversed by Basaltic dykes constitutes the greater part of the geology of the Mountains of Madeira, as is evinced by the contrast between the natural actions in the valleys of the Interior, and Sea Cliffs on the Coast of the Island.

In the Interior of Conglomerate, the Basalt is sometimes in angular and irregular fragments, sometimes in rounded lumps, and identical in structure with the varieties before described. At other times it is quite cellular and curious. Some pieces take the globular form, and their substance is disposed in concentric layers...
Madeira

Sometimes so abundant in the Conglomerate that the lumps lie in contact, and of themselves nearly constitute the whole rock. Their size varying from the size of one fish, to several fish in diameter.

All the conglomerate of Madeira, have a general resemblance to one another, not only because fragments of Porphyrion Rocks are constantly to be met with in all of them, but because almost all contain fragments of the same varieties of Rocks, bound and united in a very analogous manner, and having a very similar appearance; still there are distinct differences between them, some appearing to be of various sizes, others of different kinds and probably issued from the same crater as the Basalt.

The Conglomerate which occurs most frequently and most abundantly in Madeira, is that in which globular masses of Basalt are to be met with, (sometimes straggling, at other times constituting of themselves the body of the Rock), together with angular masses of Compact Basalt, and makers of alluvial and Pebblyaceous Basalt. Almost the whole of the Mountains of Camachao, Sants António and the
Madeira

The Declivities of the "Paul do Serra" toward the Conformity south as well as towards the North, with the heights of Ponte Moniz & Santa de Cogo. Every where present immense beds of this Comonner due, which here constitute the upper strata and furnish the arable land. The soil produced by the atmospheric and chemical changes on this Comonner, is reddish and terraceous, well adapted to vegetation provided its hardness during culturing weather is overcome by frequent irrigations. This red soil is a peculiar feature in the landscape of some parts of the Country. On it, the Convolvulus Batata, or Sweet Potato, thrives capital ly and as do the Common Batato and Vino, but the latter has to be planted very deep and as soon as possible affected by the Heat.

The Conglomerate that appears most in abundance, is the "Vorioceous Conglomerate," consisting almost entirely of shreds of various size, hardness, and weight, more or less vitrified, usually of a vinous or purple Colour and everywhere presenting vestiges and evidences of its former fluidity. It composes the "Rico de Dr. Ivan"
St. Jude and some other hills in the Parish of St. Antony-nes to the NW of Funchal; In the same conglomerate belongs the huge bed which forms the remarkable hill called Pico da Cruz, and its neighbourhood to the W of Funchal. The Peat is almost entirely formed of light brown or a dark reddish colour, vitrified and retaining on its surface the clearest indications of formed fusion.

In some localities, the Schistaceous conglomerate is formed of much smaller fragments of peocie cohesion strongly together, in which case the consistence is such as to allow of its being wrought into materials for building; it is however of inferior quality, easily crushed, and of little durability when exposed to the action of the Weather. of such is the rich bed, which occurs at Calis Grimal, whence this stone, known in Funchal by the name of "Cantaria Molli," is obtained. This noteable conglomerate of Coaly argill, contains scattered in its mass, considerable particles of hard, cutaneous, dense scoria, with distinct vestiges of fusion on their surfaces. It is intersected by numerous dykes of Basalt, and in the neighbourhood and points of contact with the dykes, the conglomerate is often found changed, being darkened and less consistent than in the rest of
Madeira

The basaltic Conglomerate of Labs Grad, is covered by a bed of another conglomerate, of a fine grain and of a brown colour, the shade of colour varying in different layers or laminae, disposed in a direction parallel to the surface of the bed, hence it has a stratified appearance when seen as a whole, and from a distance appears as if composed of different conglomerates. This conglomerate is harder than the scoriaceous, is sensibly sonorous when struck, and contains very many fragments of black and yellow tesselae, with dark, and others of a light ash-colour nearly analogous in appearance to fragments of Damm. This conglomerate is found immediately below the Basalts, the which alternating with the scoriaceous Conglomerate first mentioned constitute all the superior mass of Cape Grounds; Mammillated Aragonite is found in this Conglomerate.

Among the dykes, which in great numbers traverse the veins of conglomerate and Basalts, of the gigantic precipice "Labs Grad", there exist one situated to the East of the fall of water denominated the "Eira", which is remarkable for the nature and arrangement of the Rocks which form it; this
Madera

lake transverse the strata, almost vertically from
the sea, being in its middle portion nearly ten
feet in thickness, and is as it were a double dyke
formed of two thin walls of Basalt, the structure
of which resembles that of the other Basaltic Dike
— the Basalt is divided into laminae parallel to
the planes of these walls, the which are also or
tensibly parallel to one another, and bound or
isolate from the adjacent beds, a particular rock
composed of large crystals of olivine, included
in a matrix resembling terebraceous Basalt, felt
by vesicles, which renders it very similar to the
chrysolite — The whole mass is permeated by veins of
Carbonate of Lime. The rock, has at first sight the
appearance of a Becceria, formed of fragments alter-
nately of a dark ash and yellow colour, with
white or whitish veins interposed throughout the
whole; the figure of the yellow fragment of which it
is composed, is always that of a Olyjon, terminated
by right lines — This "Prophyritic Basalt" varies
in consistency being harder at the edges than in the
middle of the dyke, and becomes more brittle in pro-
portion as the veins of Carbonate of Lime become more
abundant or inclosed in it.
Madeira.

In the ordinary Conglomerate, with globular or elongated concretions of Basalt alternating with beds of compact Basalt in more or less regular prisms and intersected by Dikes of the same rock constituting as we have already mentioned the greater part of the Mass of the Mountains of Madeira, more especially those to the NE and E of Funchal as far as Porto da Cruz, these are to be met with here, or small beds of an almost ductile Argillite, together with lumps and beds of loose Basalt; where however we begin to descend from the "Portello de Porto da Cruz" northwards, a locality where the Mountains slope to the sea with very considerable celerity, and where they are intersected by numerous ravines, we may observe, that the Conglomerate begins to lose some of its consistency, becoming more argillaceous, and at the same time the Basalt begins to appear as if it had imbibed a silico-feruginous fluid, which renders it extremely hard, and separately cavities which appear lined with a Carnish of the same solution. The fragments of Basalt of the interior of the Conglomerate had lost their consistency and are found converted into a soft Argil which is brittle when slightly moistened — the Conglomerate...
Madeira

Conglomerate is found permeated throughout by Conglomerate
the same angiol-ferruginous fluid, which and
were varnishes the surface of the fragments of
which it is composed, and what is more extraor-
dinary, it includes in its substance crystals of
Angiolite Quartz. On attentively examining these quartz
crystals, contained in the conglomerate, it is found
that all of them are broken, one of the sides of the
crystal being always wanting, which shows that
they were not formed in the interior of the conglom-
erate, but that, torn violently from their form-
ture position, they became involved in the Mass
where they are now found. Wherever the Silico-
ferruginous solution penetrated the Mass, the concur-
scenity of the Conglomerate becomes more considerable
and this in proportion to the quantity of the fluid
imbibed. In some places this solution has all
penetrated or spread through the conglomerate,
but has left the Masses more homogeneous and
softer, whilst the Argil assumes the form of Vigny.

Some of these Argilous Vigne, e.g. one at the River
"Gambia" at the foot of the Coast of Land named the
"Lombo dos Lutas," contain a considerable quantity of
Sulphur of Iron (Pyrites) chiefly in small crystals

Iron Pyrites

Disseminated
Madeira

disseminated throughout the island, occasionally concentrated, but in groups and crystals of larger size.

Some of the conglomerates of Madeira, have (as we have before stated), well-marked characters of aqueous formation, and whilst one part of them such as those hitherto described (excepting the Quartzose), appear in massive beds superimposed upon one another, none of the beds presenting a well-marked stratification; others are entirely and perfectly stratified, generally in thin strata, the figures of stratification being parallel to the surface of the beds. These stratified con-granulates are seen frequently in the land part of the island, and in the sea-cliffs, particularly those bounding the semi-circular bays or the vicinities which are included between the salient branches of the Central mountains, and occasionally at the extremities of these Points. Thus for example the "Cabo Garcia" (Bray's Head) exhibit at its extremity, a mass formed of Beds of con-granulate, perfectly stratified, among which may be noted a variety of conglomerate composed of small fragments of Basalt, with Devine, and a great quantity of small fragments of the Olivine.
Cubs Garaja & Dragon Head
Madura

* Dragon Tree - Indigenous locality.
)
alters however, being brittle, pulverulent, and spongy.

The island was here traversed, and completely transected by a narrow gulf of Basalt, which is seen on both sides of the Cape, and which being composed of former material, than the conglomerate in which it is imbedded, has not yielded to such an extent, to the action of the weather and sea, but stands in relief at the termination of the Headland, like a vertical wall. This is the Headland, to which British Navigators have given the name "Brasen Head" on account of its tawny color, due to the tawny-yellow, colored breccious conglomerate, which enters into its formation. The beds of conglomerates and slates of stratification, dip at this Point toward the SW; their declination being considerable.

To the West of the Island of land called the "Pontinha," (from there being a small bridge above), which terminates to the West, the port of Funchal, and which is formed of breccious Conglomerate, and Compact Basalt, there exists a formation in parallel stratified beds, well worthy of notice, and which, like that of the Brasen Head, is evidently to be included among those ancient...
Madeira

origin; this formation, setting out from the sea-
beach where it first becomes visible, consists of
(1) a bed of stratified conglomerate, or rather of
a bed slightly consistent deposition of small
fragments of Pumice, slightly altered and soft-
ened; upon this bed another (No. 2) of a dark co-
love and Earthy appearance, also stratified, is
superimposed, and this again is covered by
another (No. 3) formed almost entirely of very
small fragments of light vitreous course of a
dark color, equally stratified throughout,
and more or less flattened by a cement of
an earthy appearance; a fourth layer overlaps
this and, consisting of a grey-coloured earthy
looking conglomerate, containing in its lower part
numerous small fragments of Pumice, and in the
upper part permeated by coarse Carbonate of Lime,
which forms a crust in the figures of stratification
and when in greater abundance often contains
fragments of Corallines, converted into Carbonate
of Lime loaded with Silice —. This 4th Con-
glomerate with the Calcareous Beds lends this for-
nation of the "Pontinha" with a more extensive
one hereafter to be spoken of, existing in a dis-
entangled
Madeira

disentangled state, near the Village of Canical, Confined on the Point "St. Lawrence", as well as one in the Island of Porto Santo", together with the ground immediately above the "Praia Formosa", being the Base of the "Pic da Cruz", so often spoken of above this conglomerate, comes (5 south) a second bed of dark loose scoriae in small fragment, the lowermost one that we began with; above this a sixth, consisting of a hardened argil of a "Volcanic" Brownish red colour, dividing into Pentagonal Prism, of various sizes, and whose axes are essentially perpendicular to the plane of the Beds.; 7 1/2 and lastly, upon this argillaceous bed there stretches a layer of some feet in thickness of compact Basalt, divided into prisms and more or less regular angles. These beds dip to the SW with a moderate declination, and are entirely lost to view under a thick bed of Basalt, a little beyond the right bank of a little streamlet called the "Aireiro stream", along the course of which, the above mentioned arrangement may be verified for a considerable distance, the slightly varied; thus, close to the Ravine of the Steamlet, we find the following section, raising our eyes, as before, from the Base, or Sea Beach.
Madeira

1st. Yellowish Tufa, almost hidden by the large masses of Basalt and tufa which have fallen from above.

2nd. 7 feet of serice or cinder.

3rd. 10 feet of yellow Tufa.

4th. 7 feet of serice with narrow horizontal vein of Tufa.

5th. 8 feet of Red Tufa.

6th. 15 feet of Compact Basalt

45 feet in all for the height of the section.

All these beds are more or less horizontal (says Bowdich's Excursions 86. p. 19) only varying from that position by slips. As we walk to the Eastward, the section deepens gradually to about 100 feet and the yellow Tufa (No. 1 above) at the base becoming more exposed, discloses two horizontal bands (varying from 2 to 3 feet) of angular and more or less rounded fragments of Timone, the larger not exceeding the size of a Walnut, and inserted as thickly as possible in yellow Tufa. Immediately after or at about 600 yards from the Pontinha the upper Columnar Basalt is abruptly discontinued, not from having been removed, but from this point being the Eastern limit of the stream out of which, (this face or section, has been created, and from no other stream of this upper Bas-
Madeira

- salt having directed itself towards the sea, as if on the rise, and that close to the Pontinha, on the East. Of this we may easily satisfy ourselves, by examining the direction of the Basaltic ridges, which mark the course of the streams and the surface of the country behind, and level with the cliff in land. For some distance, the cliff presents nothing but the beds of Traia and Coverise and Pannico, in short precisely the same as the section described, taking away the beds of Cluner Basalt, but a step on the Eastward terminates in the appearance of Scoriaeaceus Basalt, beneath the yellow Traia, which has hitherto formed the lowest bed of our section, and has, as if it were a prolongation of the bed of Piceans and had forced its way through the yellow Traia. This

The breadth of this stream of Scoriaeaceus Basalt is about 50 yards. The depth of the upper or
Madeira

faulted part is about 20 feet, that of the lower part
(which is composed of sheets and ridges running
into the sea and dipping to the south at an angle
of 20°) is seldom more than four feet. Beneath,
this porphyric Basalt is red, passing into yellow
Tufa with a band of Pumice at the lowest visible
part of the bed, which is about ten feet deep when
lost sight of. This lowest Tufa is scarcely discover-
able in the cavernous part of the porphyric Bas-
alt, is best seen in a "break" a little to the right
of the junction of the Pontinha with the land.
The cells of which this lower porphyric Basalt
is full, are generally long and narrow, in a par-
ticular section they appear confined but when
the Basalt has been cleft in an inclined plane
parallel with its dip, it becomes evident, that
their cells (always empty) are in the same direc-
tion as the stream.

When the red Tufa is in immediate contact with the
porous Basalt above it (as at the Mouth of the Ravine
of the "Abri das Secos") it is formed into small Pentagonal
Rims (as before mentioned) about two or three inches
in length, and one and a half or two in diameter.
In this case it is of a reddish brown, looks like a
baked
Madeira

baked clay (or as Mr. Smith of Sardan Hill remarks, somewhat like volcanic brick) and its specific gravity is increased to 2.06 from 1.75, which that of the Yellow Tuffa is 1.94.

The section at the "Praia Formosa," a bay which lies to the West of Ponta da Cruz also exhibits a remarkable succession of beds, mostly stratified, raising our eyes from the sea-level we perceive.

I. Blue Coloured Tornaceous Conglomerate, containing oxides sometimes in rounded masses, others in angular lumps, porous, vitreous fragment.

II. Earthy Conglomerate, of a yellow colour, with fragments of chert and some Diary, resembling that of the 4th layer in the last section but one;

III. A Conglomerate, or rather a stratified deposit of loose dark stones, in minute grains, resembling the third layer in the same section;

IV. Stratified dark earthy conglomerate containing in the lower part a great number of angular fragments of compact Basalt and humus of Peat in the midst of the Conglomerate;

V. A hard conglomerate of a gray colour, and fine grain dividing itself into thin lamina, parallel to the Plane of the Bed;
Madeira

An earthy conglomerate of a yellow colour, of various shades, containing fragments of Oolite in thin strata, with Carbonate of lime in thin acquaintance of the figures of stratification, and spreading like a varnish over the surface of the conglomerate.

"The identity of these beds with those in the immediate vicinity of the "Peleiro Seco," and consecutively with the Cretaceous formations of Ponta de Dr. Lawrence, and of "Ponta Bonita" is manifest."

The beds at the Praia dip to the SW, and at the west end of the bay, dive below the Baraß, but reappear at some places in the middle of grykes and beds of Baraß, which lie very confusedly between the two regularly stratified formations, which we have just finished describing, and proceed along the "Praia Formosa" till they meet the elevated mass of the heights of Cabeça Giana.

The formations at "Ponta de S." Lawrence are well worthy of description. As we stated at the commencement of the letter, the coast extends for nearly 3 miles into the bay pointing due E, and is very narrow, being only about 2½ miles wide at its origin, and tapering rapidly.
Madeira

It consists of a succession of Hills, the greater part of which appears to have been destroyed, so that the high cliffs on the North side behind Canical are broken off abruptly in their whole depth towards the sea, and present numerous deep lines of strata, deeply inclined to the Southward, from these broken faces; as if a considerable part of the Island had been broken off or worn away on that side, which would also seem to have been formed from a Crater now lost in the Ocean to the Northward. The region of this Point and greater part of the Elevations which form it, are composed of strata of Basalt and beds of Conglomerate; of the Conglomerate containing lobular masses of Basalt and predominating over the whole Island, as well as the reddish purple (wine-coloured) scoriaceous Conglomerate, these conglomerate being traversed by scoriaceous veins, which furnish the best Potter's Clay, in the Island, and from which Tiles for roofing the Houses are manufactured.

In the middle of these, rise a few detached Hills, formed of columned Basalt, with scoriaceous Conglomerate and traversed by Basaltic Jakes of various widths. Now in the vicinity of one of these Hills, named, from a Small Chapel on its
Madeira

summit "Pico Senhora da Piedade," the Basaltic formation is found covered or overlapped by a coarse silice-calcareous deposit, quite disconcordant, but permitting the Basaltic beds upon which they come into view, not only at the south side almost at the level of the sea, but also on the north coast at a considerable height, and the Basaltic ground which rises on the E & W sides, formed the depression or Basin which is filled with this formation. At the lower part of the Calcareous formation, there appears a conglomerate of fragments of Pyroclastic rocks, strongly impregnated with Carbonate of Lime, the Calcareous matter gradually increased in quantity, and the fragments of Pyroclastic rocks gradually diminished in number, so that at length it passes into Coarse Carbonate of Lime. The stratification of which is well-marked.

The siliceous sand, begins to penetrate this Carbonate of Lime as we approach the Sandy formation, and interrupting its stratification, causes it to pay into sheets or laminae, alternating with Compact Coarse Carbonate of Lime, and Silicious Carbonate of Lime.

It is here that the erroneously named "Fossil Field"
of Madeira, comes into view. Its appearance certainly favors the opinion, that it is a fossil Forest, and in taking a rapid view of the formation one would be inclined to name the plant fossilized as certainly the Erica arborea, now so plentiful in a living state on the island. I took great pains in making slices of several pieces which I obtained, while on a trip to Madeira in 1840, and examining them carefully under the microscope, for the use of which I am indebted to Dr. Sharpey, I could in no instance perceive any indication of the structure of a Dictyodonous Plant, to the appearance of which alone the specimens bear resemblance, and I perfectly agree with my friend Dr. James Macaulay in considering it a fossil Alcyonium. No, I do not think it is the Alcyonium alveolatum, as the appearance of structure of the pieces I have, does not agree with it. The analysis by Mr. Anderson of Leith in Dr. Macaulay's Paper, together with the structure, as viewed with a powerful microscope (with aromatic lens), I consider quite sufficient proof of its being a fossil Coral, and the structure, if it were a fossil Alcyonium, a Boreolith. It appears then that a large track of Coral of the

Alcyon
Madeira

Alcyonianal tribes have been upheaved by the elevation of the Porphyrous rocks, from Submarine action. The Death and Decay of the Alcyonians ensued, leaving the soil covered for a great extent with a Scour of Coal, the surface of which from exposure to the weather has been in a great measure worn and still is rapidly crumbling down, forming a calcareous sand similar in composition to that of the Specimen.

Several hands but no marine shells are yet found in this formation. (Love "Primitive Taxes at Horse Madlenia" Pamp. Trans. Vol. 17. p. 64.)

At the boundaries of the Calcareous formation and where the Volcanic formation overlaps it, a hardened Argil with Calcareous veins is mixed together with a Siliceous argitious sand, fine grained and easily reducible to powder.

At the extremity of the Parish, the slate have been displaced, and the ground appears torn with violence and several of the hillslopes are incipient, and here there exists a Conglomerate consisting of fragments of Preceous rocks, with a cement of Argente beautifully crystallized in globular nodules found principally in the cavities of the Conglomerate.
Madeira

On the North Coast between St. Jorge and St. Anna, on the borders of the River St. Jorge, a deposit on the banks of one of its tributaries named "Ribeira de Tabac," here appears a bed of lignite, formed, black, burning with a clear flame and yielding acid vapours. This lies on a bed of hardened argil, preserved with lignite matter, the argil resting immediately upon Basalt, which in a considerable layer also covers the lignite.

On the North side of the Island there also exists a considerable "nest" of hard white shining limestone, in the interior of which is found another smaller nest of Basalt, divided into veins formed of concentric layers; a calcareous deposit evidently subordinated to the Basaltic formation in which it is found wedged and quite distinct from the Calcaneous formation we have described when treating of the "Dr. de St. Lawrence," the vicinity of the "Fontinha," or of the "Ribeira Formosa.

Having now so far concluded the Mechanical Part of the Geology of Madeira, I will endeavour to classify the Matter herein contained, and from it draw such inferences as may be of use in determining the construction, and date of formation of the Island.
Madeira

From the foregoing matter, it is evident that the rocks of Madeira, chiefly belong to one Class or kind, and that, that order is Basalt; we have also noticed the prevalence of the mineral lime as occurring almost universally in the Basalt, generally in the crystallized state—hence it is said by Mr. Smith of Bedford, has denominated the Madeiral Basalt "Plinian Basalt."

It has also been shown that the Rocks of Madeira have been deposited in three ways:

1. By directly as a lava,
2. After having been projected into the air,
3. By flood waters.

We shall therefore consider them with reference to their immediate origin as 1st. Igneous, 2nd. Aerial, 3rd. Aquatic and Volcanic Rocks.

Igneous Rocks—This Class comprehends all those Rocks that have been fused and subjected to Eruption, and which according to the degree of pressure to which they have been subjected, or from immediate Contact with the ambient air, are either Compact, Vesicular, orosaicous.

This Class is very abundant on the Island.
Madeira

II. Aerial Rocks. When volcanoes are in a state of activity, stones, scoria, and pumice are projected into the air by the expansive force of gases and vapours, and when these stones, heated to redness, are thrown up to a great height they constitute the volcanic Bombs, which occur in many localities, particularly in the depot noticed as occurring at the Point Formosa.

In Madeira the Aerial Rocks form a part of the Island, and are chiefly composed of dark scoria and white lapilli or pumice, often many feet in width.

III. Aqueous Rocks. Torrents of water caused by the condensation of aqueous vapours are often evolved during volcanic eruptions, dragging away the ashes &c. forming the circumference of the crater. The same cause must necessarily have torn up and swept away the superficial vegetable tarts, depositing them as beds of alluvium in the valleys. Such deposits form a large proportion of the External County of the Island, and the numerous fragments of vegetable which they contain leave no doubt as to its origin.
Madeira

Volcanic rocks we have stated, form the main bulk of the Island, but the non-volcanic rocks notwithstanding their insignificant extent when compared with the volcanic, are of the greatest geological importance in as much as, that it is by the fossils which they contain, that are ascertained, the epochs at which the extinct volcanoes of Madeira were in a state of activity, as also that of which they were elevated from the bottom of the sea.

The non-volcanic rocks hitherto described are - The Marine Deposits of St. Vicente and of Porto Santo. - The Lignite Bed of St. Jorge, - the Sands of O. St. Lawrence, Porto Santo, - and the Ancient Vegetation Soil which is buried beneath the Volcanic Beds.

The Limestones of St. Vicente and Porto Santo (especially the former) are the most important deposits in a geological point of view, in the whole Island, for by the fossils they contain we are enabled to establish the epochs of elevation of the Island. In the former Dr. Smith met with the following genus - Venus -
Madeira

Tellina, 3 Assuria, 4 Astrea, 5 Actee, 6 Cardium, Fasciolaria, 8 Omeg, 9 Tolita, 10 Cyprea, besides numerous varieties of Coralline & Zophylium, he was unable to identify the species from want of Books, excepting the Astrea, apparently the A. Buli, and the Tellina appears to be T. Crassa, in the Limestone of Porto Santo he met with -

1) Gastrochaenix 2 Tolita, 3 Radioidea 2 Species, which one is Dr. Lethophaga, 4 Lactea Equinora, 6 Astrea Buli, 7 Astrea many Species, 8 Venid Vizium, 9 Chione, 9 Cyprianesis, 10 Scardia, Cardita sollycutata, 12 Cardium many Species, among which C. Casigintum, 13 Cinga, many Species, 14 Ceranora, 15 Fasciolaria 16 Tarritella, 17 Cyprea 18 Tolita. - Of these the Cardium Casigintum lines Equinora, Cardita Madeirensis, Tarritella Astrea Buli, have been recently found in the Coimbras Rock.

Mr. Bowdich who visited Porto Santo enumarated among the shells found by him - Astrea Multi-
Radiatus, 2 Plake and Cardium Edulae. These cannot consequently be the least doubt that the formation is one of the Sowerd Tertiary, probably the Newer Fiscean of Italy.
Madeira

The rest of the Non-Volcanic Rocks we have already noticed sufficiently, and from what we have already seen we may classify the Madeira Rocks as follows.

I Volcanic Rocks

1. Igneous Rocks (all Basaltic)
   a. Compact {amorphous, crythlitic}
      Prismatic & mini dykes
   b. Vesiculated
      j. Pumiceous (Mt. Anticha &)

2. Aerial Rocks (Pumice, Conglomerate)

3. Aquicat Rocks (Conglomerate-Infra)

II Non-Volcanic Rocks

1. Marine Beds (Limestone) f. St. Vicente
   2. f. f. E. of Arci Santo
   3. Sand Formation f. f. do

2. d. St. Lawrence
   5. d. d. of Mt. Anticha & Riva

3. 6 Limestone Bed f. d. of St. Jorge
The text appears to be a discussion about the island of Madeira and its geological features. The writer questions whether the island is volcanic and whether it is sub-marine or sub-aeiral. The text mentions the strata of the island being composed of various layers, and the writer observes that the layers are not uniformly arranged. The conclusion drawn is that Madeira is not a sub-marine but a sub-aeiral volcano.

The text also discusses the deposition of layers above the level of the sea and how the island has been more elevated than it is now, possibly only a small portion of what existed originally.
Madeira

But besides these strata which must have flowed at one time in the state of lava, and which are now hardened in the state of stone, and those which having been projected from the crust, fell in showers, we find numerous pieces of an Earthy Nature, many of which must have been deposited by floods of water, and then mixing themselves with cinders and stones have been converted into Tufs and Conglomerates as already described. Some of them perhaps may have been Eruptions of Clay, but we infer from the vegetable fragments which they contain that a great part owes its origin to the vegetable soil which formerly covered the Island, and when we examine these beds with reference to their interstratification with the Igneous Rocks, we find evidence of numerous Eruptions which must have been separated from one another by long intervals of time. But anterior to the most ancient of these Eruptions, there are Rocks of an entirely different character, and when we ascend the Mountains we find at the height of some thousands of feet, strata, full of Coraline, Shells and other Marine Seaweed, which must have been formed at the bottom.
Madeira

of the Sea. These beds evidently lie below the age of the Sub-Aerial Volcano, and as the shells belong to the Tertiary series, it is a necessary consequence that the island was elevated from the bottom of the sea during the Tertiary Epoch, and thus it is probable that the volcanoes were extinguished before the conclusion. In one of the new deposits we find a bed of terrestrial shell which have hitherto undetected by Dr. Lomu, an eminent Naturalist now resident on the island, and who finds that the greater part of them are still to be met with, and that another portion have become extinct or remain unknown. In a portion which is characteristic of a New Tertiary formation - the Pleistocene of Lyell.

From these facts, briefly mentioned, we are enabled to designate the island of Madeira as an Extinct Sub-Aerial Tertiary Volcano of the Pleistocene Period (of Lyell).

We are most naturally led to ask: Are there any well marked vestiges of a Crater or of Craters in the Island? The answer is in the Negative for no well marked evidences of any center of...
Madiera

Eruption existed, and the various writers who have attempted to clear the subject seem only to have made it more complicated. All seem pretty well to agree however in considering the "Cascal de Veias" or Mensfold, a talcally of a circular form situated between the very loftiest of the Madiera mountains, as probably one of the Volcanic Centers of Action - but with regard to the neighbourhood of Funchal the writers (Mr. Bowdich & Mr. Branswick & Aberguey) have come to very different and opposite Conclusions. Mr. Bowdich speaking of the Bantie rocks which surround Funchal says that they indicate very distinctly the course of the igneous currents which cover the Island: whilst Mr. Branswick & Aberguey could find no vestiges which could indicate them "the directions of eruption with any kind of analogy with the actual Conformation of the Ground": the latter certainly seems the more Correct - and Bowdich's supposition that the Steate can from above is certainly erroneous for we find that the Volcanic beds are silicified from the summit to the Base of the Hills, and as he says that they appear as
Maderia

detained and hardened whilst running in the state of liquid from above. It also repudiates the idea of the Day of Judgment being a Leg- end of a Crater. For days he "The Rocks are not more calcined or vitrified than those of the Interiors, and instead of rising in lofty masses, as if they formed the walls of a Crater, occur in considerable depth and have the most evident indications of having flowed from the height of the Centre and Interior of the Island."; now

with all due deference to the opinion and memory of a man so eminently scientific as Mr. Bowdich, we must beg to differ from him, for the Rocks to the West of Funchal between the "Paulinhoa" and "Ponta de Cruz" are certainly more calcined or vitrified and vitreous than those of the Interior of the Island; then we do not know but that the Walls of the Crater may have been broken down during the course of ages in the turbulent evolutions of Nature. We know very well that in 1792 Papuan Dayang, one of the highest volcanoes of the Island of Java, was during an eruption, reduced from the height of 2000 to nearly 5000 ft, and it would be easy to multiply such examples - why
Madeira

Now, is it not possible, that such an occurrence (Lava) took place in Madeira?; and as for the indications of their having flowed from the heights in the center and interior of the Island, they are certainly not very evident.

Again, it is impossible in all cases to trace the origin of Torrents of Lava or of Beds of Lava, and whilst considering the various heights such as Torrerei or Rincos or the summit of the dead beds of Lava covering perhaps a whole city for once time was fertile soil, we ought to remember that it is only an improbable supposition that those Mountains were at one time some thousands of feet higher than they are at present and that in the Figure of the Volcanic Eruptions we find sufficient power to account for the apparent zone of regularity, which enables our tracing the volcanic strata and cones of Eruption. (Mr. Smith).

We are then of opinion that part (between the Ontivera and Porto de Cruz of the Bay of Funchal) is a Segment of a Crater - for all only the most essential manifestations in the neighbourhood, but inhabited in Rumic or Senhora and it is in the immediate neighbourhood of Porto de Cruz that we find the...
Madagascar

Canal's Volcanic hills as often alluded to, viz. "Pic de la Cruz" and many of their "Lateral Cones" exist in the immediate vicinity of Funchal, on the East and South sides as well as the West.

With regard to the Causes which must have produced the external Configuration of the Island, the subject is involved in very considerable difficulty and perhaps insurmountable difficulties, Dr. Smith on this subject says, "I am inclined to attribute the irregularities of the Surface of Madagascar rather to Volcanic Agency than to Convolutions of Earthquakes, for I could find no fracture or dislocation in the beds which indicate such causes; the figures into which the lava was injected must have been without a doubt the work of shakers, but I could not find any proof of violence to its peak an extent as to displace the beds on either side of the Depress or to alter the Configuration of the Surface. It calls for an apparent rupture of the stratification the horizontal beds which compose it, stop suddenly, and are followed by another series entirely different, which dips towards the East at an angle of about 40°; the horizontal beds are..."
Maderece

composed of Basalt and Tufa, and the deposit of Ashes and small stones, whilst the whole is intercalated with Basaltic Dykes which must be of recent date & those which pass across it and have been evidently formed by the subterranean lava struggling up on account from the interior of fissures which terminated openly upwards. It appears to me that the Mountain, composed of horizontal strata, must have presented at a former time a commencement toward the Earth, like that which it actually exhibits toward the South, and which probably has been destroyed by the action of the sea, within the hill of Fire; a second series of Cussatons Covered it with stones and ashes, and afterward the whole became cool and filled with igneous matter ejected from below upwards."

Volcanic action of Fire, we doubt assisted occasionally by slight Earthquakes and the long continued action of the Mountain Torment, has probably caused those vast cavities, which everywhere intersect the interior of the Island—such as the Concaup and it is to be remarked that though most of the Rocks are very hard yet
Madeira

That when they have been exposed for any length of time to the action of the weather, they become extremely brittle, so that we need not be surprised at their size or this accounting for them, then we consider the length of time which has passed by since they suffered their commencement.

Some have thought that Madeira is a part only of a large continent - the Atlantis of the Ancients - all we can say is, that we know nothing about it. And it is absurd to be forming theories where we have no data to support.

That there is a connection between the Canaries, Azores, and Madeiras is not improbable, but we are not therefore entitled to say that Madeira is a part of a vast continent, for we have been given reason to believe that what now exists of the Island was formed from the bottom of the sea and we have no evidence of any part having sunk again, we know only what is; what was or will be, is known only to Him who created all.

S

End of the Geology.

Botany
The Botany of Madeira has as yet been very imperfectly examined. Lists of Plants to be sure have been given by various authors, but from a mere Catalogue of Species, little is to be learnt and it is to be regretted that Naturalists and even able Naturalists should neglect to give the particulars, relating to the localities, temperature, positions, growth &c., instead of devoting their valuable time to squabbles about varieties and species.

The chief sources of information with regard to the "Flora Madeirensis" are:

1. Bowdich's "Excursions in Madeira and Porto Santo during the Autumn of 1823." Chapter IV and Appendix.

2. The Parker's Botanical Miscellany as part of new series, a list by Mr. Fred. Hill of Freder with notes by the Rev. A. J. Lowe A.M.

Madeira

As a mere transcription of these authors' lists, it would scarcely be consistent with the idea of an Original Thesis, and not having myself had an opportunity of minutely examining the Botany of the Island, I will only attempt to describe some of its most interesting features. E.g., I will endeavour to paint out the natural orders, characteristic of the vegetation, indigenous and naturalised, as well as cultivated; the Botanical Regions of the Island, &c., and conclude this part with an account of the trees, as being the Botanical production for which the Island is justly most celebrated.

From the peculiar advantages pertaining to Madeira, in respect of situation & formation, which of course includes Climate & soil, we are not surprised to find that Plants indigenous to every variety of Climate are here naturalised and for the most part flourishing; thus we find, the Banana, Guava, Orange, and other fruits of the West Indies — the Orange-thorn Peach, Apple and Tea of the Temperate Zone — the Banksias &c. of New Zealand, the Acacia &c. of New
Maderia

of New Holland, varying the landscape with
laurels, chestnuts, and vines, and perhaps with
fruit, we would hail, strawberries, gooseberries and currants. In examining
the strictly indigenous flora of the island
however, we would be much disappointed if
we expected to find a rich proportion to the
number of plants naturalized from other climes
for it barely seems to contain 260 plants and
of these about 40 are ferns, which always be-
come more abundant as we approach the
sierras.

The following are the chief natural orders
characteristic of the indigenous flora: - vir-
fungi, lichenes, filices, gramineae, lauraceae
liliaceae, rosaceae, solaneae, ericae, com-
poseae, umbellifereae, cruciferae, graminaceae
malvaceae, cactaceae, rosaceae, pinaceae, euforbiaceae, confineae
It may be remarked that those seem to be the
orders to which most plants, belonging to which flourish
best in the island when introduced; - of the
orders cultivated in gardens in the following
are the chief. - gramineae, palmæ, cactæa
Madeira

succimum, Indica, Isola, Hippeastrum, Rice
various of Composite, Ranunculacea, Malvoceae
Magnolia, Annonce, Camphoryllia, Cacte, Boyte
Castacee, Leguminose, Euphorbiace, Santaceae
Confinae &c &c. Of course to these there are constant additions. I may remark that various attempts have been made to introduce the Cocoa Nut Tree, but hitherto they have all failed; probably from the want of a sandy soil?

It is interesting to know that the Tea Plant (Thea ericha) grows admirably at the "Sardin" belonging to Mr. Keetch.

From the height to which the Mountains rise it is easy to suppose that there are several Botanical Regions, and indeed in Madeira they are tolerably well marked and easily distinguished. The First Region extends from the level of the sea to 1000 feet above it, and is characterized by the prevalence of the Cacti, as well as most of the Tropical Plants and Fruits. Among Annonae, Arounds, Musa, Canne, Citri, Cacti, Dioscor Deacode, Euphorbs, Ficus, Myrtus, Rosa, Pelargonium, Foppeter. In this region
Madiera

region also, the vines flourish best, and produce the most mellow, and high-flavored wine, such as Sercial and Malmsey. I would call this the Cactus Region, as the Cactus does not grow above it. The Second Region includes the first and extends to 2500 ft., and in one sheltered locality to 2600 feet above the sea-level. This is the Vine Region, above it though grapes are produced, they do not yield wine. Besides the plants enumerated as growing in the field we have - Euphorbia, Fruits - Fig, Grapes, Apple, Persimmon, Duranta, Erythrina, Zymippus, Hibiscus, Jatropha, Lantana, Lantana, Lucas, Moranta, P. d. A. Residum, Aculeus, Ruscus, Ruscus, Rose, Hamamelis, Lycopersicum. The Third Region extends to 3700 feet from 2700 feet, and is the Grass Region - here grow best Gramineae, Genista, Acerostichus, Ixer, Ericaceae, Compositae, Mentha (abundant) Digtalis, Acalypha, Salvia, Buns, Euchria, etc.

The Fourth Region extends from 3700 to 5300 feet, and is the Laurel Region, but is much complicated from site to locality. We find Vaccinium, Launus, Junceus, Hyssopus, Honeys Hybrid.
Madeira

Fruits, Ilex, Taxus, Erodium, Digitalis, Smilax, Lycaste, etc. Filicis (Asphodelus)

The fifth region is the last, reaching to the summit of the island 6240 feet above sea level. It consists of arborescent Ecreas, patches of Gaminia, a few Laurels, and here and there a Fern, with Lichens &c. It is the Heather or Lichen Region.

The fruits of various kinds are produced for the most part in first and second regions. The lower part of the fifth region answering to the Tropical Climate is here that the fruits of those Climates flourish; in the same way, we find that the fruits of Cold Climates, such as Currants, Gooseberries, &c. are produced solely in the upper parts of the second regions, and even with difficulty there.

I subjoin an alphabetical list of the Edible Fruits, as it gives a better view of the truth of the above assertion, viz. that Madeira possesses a combination of various Climates - Tropical, Temperate, and Cold. - I also give the varieties of each with the Native Names as far as I was able to ascertain them, though I fear the orthography is not always correct: With the Exception of those marked with an asterisk, I believe they are
Madeira

are all Naturalized and not Indigenous.

Apples of which there are 7 varieties, viz. -
"Maldo", "Guho d'ouiro", "Cara de Sama", &c.

Apricots - 3 varieties, "Damasco jegitins", &c.

Banana & Plantain (Musa)

Blueberries (Wild) (Vaccinium plumagium)

Barbexes (Pod of Aratorniaシリカ) Cultivated

Cherries - 2 varieties Cultivated & 1 Wild.

chestnuts (Wild?) (Fagus Castanea)

Citron - much cultivated (Citrus)

Cape Gooseberries (one of the Solanace).

Coffee - much cultivated. (Coffea arabica)

Currants - very rarely produce fruit (Ribes rubus)

 Custard apples (Anona)

Date (2 trees on the Island produce them)

Figs & varieties, "Cottio", "Franco", "Mulatto", "Pinto", "Doe"

"Martinho" - "Bebera Pinto" B. Franco

Geranos (Argelius pygferum)

Gooseberries

Grapes of which I have been told there are about sixty varieties, but could only ascertain the names of 33, viz. Sercial, Bual, Verdelho,

Tinta, Malvasia, Bianca, Coa, Regriño,

Negro, Bota are the Wine producing Grapes
Madeira

Alcanc, preto, branco, Muscatel branco, Ron, Lestrais, Le de Lisboa - are the best grapes for the table - Bastard, Fino, Secco, lemon, Mor de Melia, terance,鲍兰朵, preto, branco, Babosa Marta, 23 Canavas, Periquita, De aqua de Mel, Galiza, Castelhar, 28 Brings, Terceira, Terra, De do de Dona, Melossa, 22 Minda, these last are grapes of an inferior quality, chiefly grown to engrast upon with the better varieties.

Granadilla + varieties (Passiflora quadrangularis)*

Lemons & Limes

Mangoes

Mulberries, 2 varieties - Black and White

Nectarines

Oranges, 4 varieties - Sweet, Bitter or Seville Range, Blood and Tangarine

Papaw (Carica papaya)

Peaches

Peach - 3 or 4 varieties but very inferior in flavor, to those produced with us, even and small.

Pears - fruit of Cactus quinio

Pineapples

Pomegranates
Madeira

Quinces, are much cultivated, and used in wines.

Raspberries.
Rose-apples.

Haddock.

Strawberries - The wild "Fragaria vesca" is found on the mountains, and one garden species cultivated and thrive well.

Sugar Cane

Tomato or Love Apple.

Tamarinds - I never saw any.

Melons - Water, & sweet.

These are I believe all or nearly all the fruits that grow in Madeira, but as the Grape is the one for which it is most famous, I will now endeavour to describe its cultivation and manufacture into wine more particularly.

The Vine is generally supposed to have been introduced into Madeira from the Island of Cypri, but at what period it is difficult to say; some have stated that it was imported from Portugal, in all probability both opinions are correct for the plants may have been brought from both these places, and certain it is that they have since been received from Portugal - Spain, Turkey, France.
Madiera

Franz, Germany and many other places.

Chaptal says "En 1429 plusieurs Souverains de l'Europe contournent obtenir le vin de
leves de vignes qui croissent dans les terri-
toires de leur domination; les Portugais a-
voient introduit dans l'Ile de Madere de
Plants de Celle de Cypris, dont le vin passait
alors pour le premier de l'univers et c'est
oit aussi aussi". The fact however if this
seems to be quite incorrect, or at least it is in-
correct as applied to the introduction of the Vine
into Madere; for according to most accounts
the Island was not discovered till the 10th of
August 1419, and was then, and for a long time
afterwards Complety Covered with Wood (whence
its Name). Again another statement says
that shortly after the Colonisation of the Island,
the king and wise Prince Henry of Portugal,
had the Sugar Land transplanted thither from
Sicily, and it succeeded admirably: the first
Sugar Mill was built in 1432 and such was
the extent of the cultivation of the Plant that in
1496 there were upwards of a hundred Mills,
Sugar was the staple commodity and its manu-
facture
Madeira

The manufacture was then at its maximum height; the rivalry at length became acute, that some were induced to cultivate the vine, on a large scale (the plant having been early introduced), and their success was so great that others were induced to follow their example, and the growth of sugar became gradually superseded by that of the vine, so that at present there is only one mill working on the island. The following occurs in one of the Registar Books of Wills: "In 1731 Ios. Africa Coutin, who died at the Village of Camera de Lobos, desired that the debts owing to him should be employed, partly in buying a ship, wine and wheat, for an offering on occasion of the first Mass being celebrated at an altar he had erected in the Church of Nossa Senhora de Calheta, so that there must have been wine there. Though it is probable it was not introduced till some time after the discovery of the island; and taking all these circumstances into account, it is probable that the vine was introduced into Madeira about the year 1430 or 1435, but certainly not before 1420 or even 1430. In the list of fruits, I have mentioned some
Madeira
some of the varieties of the Grape grown on the
Island, but of these only a few are generally
cultivated, or allowed to come to maturity; the
rest are exclusively for the Table, being usually
larger and more watery than those used in
making wine, which suffer from their sickness;
the third set consists of those which of themselves
produced poor grapes, but do admirably to propagate
upon, with the finer varieties either of first, or of
the second class. The best grapes for the
Table are Alicante, Muscatel, Leryão, and the
Wine Grapes, which are, Cercial, Malvasia, Buci,
Verdelho, Bastardo, Tinta, and Pedro Molle.
The varieties are distinguished from one another
by their leaves.
Cercial has a leaf with 4 rounded cusps; the
nerves are very strong, and by their pro-
jection give a cocked appearance to the
leaf. Colour very yellow-green, and cottony
on both sides.
This is the last edible of the Wine Grapes.
It is said to grow best under precipices, in
places which attract the clouds and as the
bush is very thick, is left longer than the
other
Madeira

others to ripen - It produces a "Dry" Wine esteemed
the best of the Madeiras. The grape is The Rock
grape, but the Wine produced from it is very dif-
ferent from Rock.

Malvasia. There are 3 varieties of Malvasia - Cadel
or Candy is the best, but produces little - Its
leaf has a very deep and rounded sinus with
2 others less distinct; each dentation has a
small yellow tip; the back of the leaf is as
smooth as the upper surface, and it is of
a deep yellow-green color. The other
varieties, "Babosa" & "Malvasian" yield pretty
abundantly, but the latter is very inferior.
They are less marked but all have the same
smoothness and yellow tips. It is stated
to have been introduced from Candia (hence
the name Candy) before 1445 by Prince Henry
(Coleção de Notícias p. 11)

Albal. Leaf 6 lobed, four of the sinuses are
even deep and sharp - two lower are indis-
tinct - dentations sharp and irregular.
Leaf hairy on both sides.

Verdelho - Leaf 7 lobed, 2 lowest lobes very
indistinct, sinuses not strongly marked; dark
Madeira

... dark green; and perfectly bald.

Bastardo. Leaf broader than most others, lobes indistinctly marked; indentations large and sharp. Colour, light yellow green. Back downy. The whole assumes a cocked appearance.

Sinta. Varieties. a. Lobes decreasing in size easing very deep and roundish, middle lobe subdivided into two others, both indistinct. b. Smaller and more compact in form, lower sinuses much by deep than the others. Both are of a dark green with purple spots and downy at the back.

Negro Molle. Leaf 5 lobes. 2 lowest closing but not adhering over the stalk, cilia deep and round. Indentations large and rounded. nerves strong and projecting. Back slightly downy. Back yellow-green inclining a little to red at the base.

These characters will I believe almost invariably distinguish the varieties to which they respectively belong. It is curious to notice how by a mere glance a Madeira merchant will distinguish the varieties.
Madeira

"For the cultivation of the Vine a free, light, sandy, or gravelly soil is preferred in consequence of allowing its roots to spread wider and to draw nourishment with ease, from a more extensive surface; a stiff clay opposes its growth, and is unfavourable on this account. In some places the soil is very poor and requires frequently to be assisted with manure, for otherwise the plants soon decay or produce very beauty of fruit; it is however a curious fact that the lands which produce the best wine are in general rather poor. Hence evidently in the culture of the Vine, a great deal must also depend on local situation."

The manner of propagation is as follows: The slips or Cuttings of Vine are separated by a diagonal cut from the parent stem at the third or fourth leaf; they are then placed in trenches from 4 to 7 feet deep, which are nearly filled up again, the slips being protected at the bottom by a quantity of loose earth; in this state they take root, and grow rapidly and in three years are producing grapes which however are not fit for wine till the fourth year. In some places the cuttings are first planted in tubs and then transplanted to the ground but this is all common.
Maderia

Command. When forming a plantation on the southern part of the island, the "Verdelho" slips of the Porto are preferred as it improves considerably from the better soil, climate and aspect, and on this they engraft any other variety they may wish.

When once the cuttings have begun to throw out branches, stakes are driven into the ground at equal distances, which are to support a trellis work of the common cane of the Island (Arundo Donax), the squares of the trellis work being about 2½ feet in diameter; the canes are tied together with bundles of twigs of a kind of Willow (Salix rubra) which is cultivated for the browse, or with strips of the dead Banana tree. On this trellis-work which is about four feet from the ground, the vines are trained and tied down to prevent the spring gales from breaking the young shoots, notwithstanding which however, sometimes whole vineyards in exposed situations are as completely laid bare as if the branches had been taken and stripped with the hand, neither peep nor leaf being left; between the interstices of the trellis work the grapes hang down, and as they advance to maturity the leaves are gradually removed so as to allow the sun to have its full in-
Madeira

influence upon them. In some places where the vines have differed sooner than in others of the same vineyard, they are obliged to be bagged in paper or muslin and pieces of paper are tied by one end and waving in the wind, are hung at short distances to frighten the cats, lizards &c. which devour immense quantities of the fruit.

The vine produces fruit as high as 2700 feet in Madeira, but no wine can be made from it; the greatest height at which it is now cultivated for this purpose is in the Valley of the Convent de Freiras which is 2080 feet above the level of the sea.

An English Acre will produce 4 pipes of wine under the most favourable circumstances, but one pipe (of 110 Gallons) an acre is the average produce of the vineyards throughout the island.

The time of pruning varies a little: some prune in February, others in the middle of March; it depends principally however, on their forebodings to the weather when the flowering takes place which is from six weeks to two months after the pruning; thus if from general appearances, they expect heavy gales at the usual flowering season, they delay the pruning for a week or two, or they prune earlier so
as to allow the Branches to have acquired sufficient
strength to withstand the gales. A vine if well
attended to and if well situated may last sixty or
several older than that on the Island.
The grapes when ripe have a fine, full, mellow,
high-coloured, semitranslucent appearance, and
when examined carefully, particularly on the outside
of the Malvasy grape, minute crystals of sugar
may be seen glittering in the sun, and communi-
cating a sticky feeling to the fingers: when they are
in this state which is in general about the begin-
ing of September, - men, women, boys, and girls,
[but not dogs unless concerted to prevent them eating
the grapes] creep under the Trellises with small
baskets and sharp knives for cutting the grapes,
when these baskets are filled they are emptied
into larger ones, when when full are carried and
emptied into a Wooden Raugh, called the "Lagai"
about six or eight foot square, over which there
is a large slanty cover, extending five or six foot
beyond it; this Machine is generally in a small
shetched out house, the apparatus of all agri-
cultural implements - which consist merely of the
Rate and Uprade, when the Raugh is nearly filled
for
Madeira

two or three peasants, bare legged and barefooted, get into it, and with their feet press out the juice of the grapes, until they can get no more out of them by that mean. The husks and stalks are then collected into a heap, and being kept together by a cope wound round and round them, are placed under the level, to the end of which is attached a wooden screw with a heavy stone at the bottom, by working this screw upwards the weight is released from the bottom and thus presses the grapes under the level, the process is repeated several times, and the last pressing produces the strongest and choicest wine; the wine juice having run into a cask is removed, and the water is poured on the husks, which are again pressed, and the diluted juice thus obtained called by the Natives "Aqua Pē." The literal meaning of which it is unnecessary to give, is considered a refreshing beverage, particularly when bottled and allowed to ferment.

The manner of making "Tinte" wine from the Black or Barjundy grape is somewhat different. The grapes then only undergo one pressure by the level and are afterwards drained through a sieve which allows the
Madeira

The bunches and seeds are left on the stalks, the stalks only remaining behind; the whole is put into a vat open at the top, stirred twice a day for about a fortnight, and then the fermentation is finished; it is racked off into casks.

The treatment of the must or unfermented wine is also simple; it is taken out of the receiving cask the same day it is pressed and put into others in order to undergo fermentation which begins almost immediately and appears by the liquid rising and evolving a considerable quantity of Carbonic Acid gas. The quicker the wine is, the stronger is the effervescence which generally ceases in about a month, but a slight degree of fermentation continues for some time longer. During two months after being transferred to these casks, it is twice a day agitated with an instrument (a flattened wooden staff about 3½ feet long) made for this purpose.

When the fermentation has ceased and the must has become viscous it is separated from the sediment and clarified by Dringlass, white of Egg, blood of white, whilst the sediment itself undergoes distillation for Blandy.

The produce of one year must frequently be treated anew.
Madeira

very differently from that of another; when the grapes
are green, the fermentation must be checked, when
they are cut from unreasonably warm, it must be ex-
acted - generally speaking, the drier the fruit the
more difficult the fermentation.

The juice as we have said undergoes active ferme-
tation for about six weeks but a slight fermentation
continues for two or three years, during which time
the wine is several times racked off and clarified.
It is known under the names of "Tinta" or Madeira
Burgundy (being made from the Burgundy grape)
Malmsey, Tural, Bual & Common Madeira
"Tinta" is a dark wine almost as dark as Port
and like that wine the colouring matter is de-
plicated with the Tartar (bipartite and bitartrate of
Potash) in crystals, forming what is denominated
the "Black" as the wine get old. It is made from
the Tinta grape or Burgundy alone. This kind
of Madeira is not much known out of the Is-
land, it is cooling, has a stiptic taste and an
agreeable sharpness (not acidity) and when old
some estum is better than Port, in the New State
it is only to be drunk on the island and in warm
weather as it is a most refreshing beverage.

Malmsey
Madeira

Malmsey, called by the natives "Malvasia" from a town in Turkey, whence this vine was imported is too well known to need description. It is "Ladies' Wine" being sweet and strong, of a light brownish color and has an oily feel and rich nip which makes it very pleasant to the palate. It is more as a liqueur at first, as from its richness and sweetness, much cannot be taken at a time. It is made from the Malmsey grape alone. Special is perhaps the finest of all "dry" wines as Malmsey is certainly the finest sweet wine. It is considered the finest of the Madeiras and fetches the highest price. It is of a light brownish color. The grape is the Stock grape, the best is grown on the south side of the Island, at some distance to the westward of Funchal.

Bual & Colheita Madeira are what are usually known in England by the Name of "Bual." The former is made from the Bual grape, the latter from a mixture of Bual, Verdelho, "Pessegueiro" & Bastardo. They are "dry" wines of a brown color resembling cherry and are excellent Table Wines.

Grapes are grown principally and are of the finest quality in the south side of Madeira. On the South
Madeira

wide, the vines are principally trained on trees, but the grappas or ground vines always a green
rowed look, and the vines grown on the north side
are much poorer in flavour, aroma, and quality,
so that they have to be "treated" with all possible
care to render them at the end at all palatable,
in fact most of it is now distilled for alcohol.

There is a kind of wine called "Viues Arideo" or
"Bruni Wine" made by suddenly stopping the fermenta-
tion of the Common White Wine by adding an equal
quantity of strong Brandy to it, hence as may well
be supposed it is exceedingly strong and sweet. It
is sometimes used as a liquid, but it is chiefly used
to give richness and flavor when added in small
quantities to the other wines.

Having now described the method of making
Madeira wine, I will say a few words as to its subse-
quently treatment. When the Madeira Wine Trade was
in its infancy, there was little or no direct communi-
cation with Britain, it was necessary therefore in
order to convey the wine to Britain, to ship it in vessels
going round by the East or West Indies and the back
of those climates (perhaps the baking on the voyages)
was found greatly beneficial to the wine; this induced
certain
Madeira

Certain Merchants to form an artificial climate. In so far to be called in Portuguese an "Estufa," which is nothing more or less than a cellar made as impervious as possible to the air and heated within by a furnace and flame, which caused the temperature as high as higher than it would naturally be in any part of the globe.

All Madeira Wines are not submitted to this process, but almost all are; it is used also for those of the Canaries, Azores, Sicily &c. The lower qualities of wines generally remain three months within the Estufa submitted to a very high temperature, the better qualities are submitted to a lower temperature, and remain exposed to it for eight months or even a year.

There are from 20,000 to 25,000 Drums of 110 Gallons made annually and about one half of this number is exported, chiefly to Britain & America. The rest is partly consumed on the Island and the poorer qualities are distilled into Brandy; three pipes of the Wine yielding about one of Brandy.

There is less Brandy used in the treatment of Madeira wine than in that of any other Country the wines of which are of the same class as Madeira on an average there is not more than five gallons
Madeira
of Brandy to the hundred and ten of wine.

Madeira wine was scarcely, if at all known in Britain, before the middle of last century when it was brought to England by our officers who obtained it among the colonies at the commencement of the American War in 1755. In America, it was sold and liked principally from their obtaining it genuine, and far cheaper than European wines. "By an act of Charles II (xv. Ch. 57) Great Britain had the monopoly of supplying all the colonies with every commodity of the growth or manufacture of Europe. The colonists could not afford to take French and other European wines, loaded in consequence of this with heavy duties, and thus Madeira wine, still being a European commodity and allowed to be imported directly into America and the West Indies came into general use there." The wine thus received into England was excellent and had vastly improved from being in a fine warm climate, and the result was, that Madeira wine was much bought after. Men of war touching at Madeira, took large quantities for their own consumption and to bring home. The wealth of the island increased
and in 1790 was at its highest pitch of prosperity. The demand for Madeira was unabated and was at length so great, that in order to meet the demand of the market, some merchants of minor character were tempted to import wines from the Canaries and Azores treat them in Madeira, brand and ship them as such. This shameful fraud as might be expected, brought the wines into discredit, which however is rapidly going off as its superiority when genuine over every other wine of the class together with the known honesty and credit of the present British merchants in Funchal will undoubtedly shortly lead to a great increase in the trade of the Island with Britain." (See "Madeira Illustrated")

Having now to the best of my ability concluded the description of the Vine and the manufacture of Wine in Madeira, I will close this section of the thesis by describing the process of varnishing Fishing Lines in Madeira in Mr. Lowe's own words; he having first described it in the 16th Vol. of the Linnean Transactions, page 396. — He says, "Among the few plants of much importance in their domestic uses peculiar to Madeira —..."
Madeira

*Ficus venosa* is distinguished for the use made of it by the fishermen in preserving their nets and lines. This species belongs to a genus which peculiarly characterises the vegetation of this island as well as of the Canaries, grows in the greatest abundance on the rocks in all parts and is particularly plentiful on the sea-cliffs; it is by no means confined to maritime situations but occurs in almost equal abundance in the interior, to a considerable elevation. All parts of the plant, but the stem, particularly are covered with a clammy, viscid secretion as if coated with moist varnish. It is probably the chiefly which renders the plant so useful to the fishermen in preserving their lines and defending them from the action of the salt water; this is the account they give themselves of its use, to which may perhaps be added the stiffness and smoothness it gives, rendering them less liable to entangle. It also is said in some measure, strengthens them and diminishes friction and the dark colour renders them less visible in the water. It is thus applied: A large quantity of the plant being collected, the stems are bruised with stones,
Madeira

(usually by children) till the Bark can be readily stripped off; the leaves and young shoots or flower stems being rejected as perhaps containing a weaker, less acid juice which would too much dilute the rest; the Bark thus collected is pounded in aough mortar, till its fragments are sufficiently small to allow a handful of them to be rubbed with a cloth backwards and forwards along the out-stretched line, till they are well saturated with the juice; they are then coiled up and put to steep till the following day in some alkaline liquid, usually common urine, when the rubbing is repeated if necessary, i.e. if the line does not appear uniformly black and evenly coated in all points. If when dry there still appear any knots or inequalities it is put to soak in sea-water for the purpose of softening previous to any more rubbing. When quite finished, it has become black, perfectly smooth, even and shines as if coated with varnish or rather with shoe-maker's wax, except that it is not at all clammy; it is also rather hard and stiff but still perfectly flexible.

There are still several interesting subjects connected with the Botany of Madeira, but I fear I have al-
Madeira

already gone beyond the proper limits of a Thesis, and must therefore not enter on them at all, but I will now briefly speak of the next subject connected with the natural history of the Island, and with which I am at all acquainted, viz. its Ornithology.

The Birds found in Madeira are chiefly those of the south of Europe and a few from Africa, but it is exceedingly difficult to collect them.

The following is a list chiefly collected by myself in 1840—for the others I have given the Authors.

Raptores. Falconidae

1. Falco tinnunculus (Kirtzel) Commiss
2. F. auslodi (?). Cav. Bowdich p. 42
3. Buteo vulgaris (Buzzard) (Manta, mi). Dr. Antunes
   (Bowdich calls this "Linnæus Granta"

Strigidae

4. Strix flammea (Barn Owl) Dr. Antunes

Anseres. Anseres. Merulidae

5. Turdus merula (Blackbird) Commiss
6. S. ? Dr. ? Bowdich

Sylviae

7. Entheca rubecula (Redbreast) near Funchel.
Maderia

*Sylviidae* Contd.

8. *Cerca atercapilla* ? (Blackcap) - Dullewe
   C. *Heiniae* (Santo ize) - Peto 2 1/2 Aug 94
   C. *Melanoccephala* - Bowdich p 29.

9. *Passer caeruleus* ? (Blue Tit) - Camera de Lobos.

*Paridae*

10. *Motacilla flava* (gray wagtail) - on shore.

*Anthidioe*

11. *Anthus arbores* (Tree Pipit) - Common

*Insectes* Conistichia

12. *Horda arvensis* (sky lark) - Common

*Fringillidae*

13. *Fringilla Coelebs* (Chaffinch) - P. Harris 2 Aug 23


15. *P* - Domesticus (House Sparrow) - uncommon

16. *Coccothraustes chloris* (Greenfinch)


18. *Carduelis elegans* (Goldfinch) - Common

19. *P* - *Spinus* ? (Siskin) - uncertain 2 P.M.

*Muscoidae*

20. *Sturnus Vulgaris* (Starling) - rare (A. P. Linn.)
Insects


(The Cuckoos and Roller have all been seen in Madeira at the natural of Affied)

24. Merops asperata (Bee Eater) Several have been seen.

25. Hirundo rustica (Swallow) on hills but rare.
27. Apus cinereus (Iridico & Kelly pl. 83)

Raptors

28. Columbidae
29. columba palumbus (wood Peck) uncommon
30. C. venus (black Peck) Mt.
31. C. livia (Rock Peck) Blue Ar. Constantin.
32. C. troscaf of Minikiel (G. R. Gray)

Heronidae

32. Ardea culda (Red legged Crane) on Mt.
33. Butorides decipiens (Quail) 2.

Gallinaceae

34. Gallinus domesticus (Quail) 20.
35. Streptopus collaris (Tarrystone) 20.
Madeira

**Gallicorhina**

30. Botaurus philomela (Little Bittern) F. Krüster

31. Ciconia nigra F. Krüster

**Ardeidae**

32. Botaurus minor (Little Bittern) F. Krüster

37. Ciconia nigra F. Krüster

**Ciconiidae**

33. Botaurus lentiginosus (Woodcock) all year round

39. Gallinago (Snipe) F. Krüster

**Ballidae**

41. Circus cyaneus (Landsail) F. Krüster

42. Gallinula chloropus (Moorhen) F.

**Ciconiidae**

43. Fulica atra (Coot) F. Krüster

**Pelecanidae**

45. Alca (Ferry) ? (probable)

**Alcidae**

44. Vidua in the (Gannet) (Young and adult)

Bowditch mentions a Gyrhus (p. 93) and Loxia
enucleata—also Upland Caperci, probably
Upland eophis. The latter maximus of Upland
of fulmar is salted and eaten by the poorer
classes.

The etymology of Madeira is being carefully studied
by Dr. Lane who is bringing out a work on the sub-
ject.
Not entered into, owing to the length of the previous subject.
Madeira

The remaining department connected with the Natural History of Madeira, have been scarcely, if at all examined. I therefore pass on to the consideration of a very important subject viz. its Climate.

The superiority of the Climate of Madeira above all others is a fact so generally admitted, that any description of its advantages may be superfluous, particularly as the subject has been ably entered upon by various writers. Still as especially connected with the Medical Department of this工作, it will be useful to collect the substance of what has been said on the subject and to add such observations as a short stay on the Island in 1840 enabled me to make.

The excellence of the Climate of Madeira is due no doubt to its peculiar situation and formation—an Island, composed of lofty Mountains, situated to the southward of any part of Europe, at a considerable distance from, and beyond the influence of the Continent of Africa, but not far from the Tropic of Cancer. Here we have a combination of circumstances which would lead us to expect a fine Climate; but what we have more particularly to do with is the Climate of its Chief Town—Funchal—
MADREIRA

This town is built on a tolerably level piece of ground, round the margin and in the immediate vicinity of a large bay: on the NE, N, and NW sides it is completely surrounded and sheltered by an amphitheatre of hills rising behind it very rapidly to the height of about 3000 feet above the sea-level. From the margin of the Bay the towers extend to a considerable height on the sides of these hills, from which three considerable streams arise and pass through the town to the sea, with such impetuosity as to prevent the water ever stagnating but rather tending to cool the neighborhood and doubtless carrying away many air-purities which would otherwise infect the atmosphere. Thus Funchal is open only towards the south, and being completely sheltered by the amphitheatre of hills from cold north winds, its temperature is very equable, and this is the chief quality in the excellence of the climate. From the heights to which the well-wooded mountains rise, we have only to ascend or descend theirinclined to vary the climate, and the town itself being broad and warm; in spring snow or rather slush infrequently lies for a considerable time on the mountain tops, so that for invalids the neighbourhood of
Madeira

Funchal is the best locality. The cooling of the atmosphere at the top of the mountains much increases that condensation of the air by land which produces sea-breeze, always increased in proportion to the heat, hence shortly after mid-day what is called the "Land Breeze," flowing from the land to the sea. In a great measure removes the oppressive heat of air almost tropical and from this cause also the temperature of the air varies less throughout the day. We now see why the climate should be better than that of other places for none have equal combinations in their favor. The advantages it presents, over the best climates of Europe have been very clearly pointed out by Sir James Clark in his works on Climate. He says: "The mean annual temperature of Funchal is 64°, being only about 5° warmer than the Italian and Provengal provinces. This very moderate mean temperature, relatively to its low latitude, arises however from the summer at Madeira being proportionally cool; for, while the winter is 20° warmer than at London, the summer is only 7° warmer; and, whilst the winter is 12° warmer than in Italy and Provence, the summer is nearly 5° degrees cooler. The mean annual range of temperature is only 14° being less than..."
Madeira

than half the range of Rome, Nice, Naples, and Biscay. The heat is also distributed through the year with surprising equality, so that the mean difference of the temperatures of successive months is only 2°F; this at Rome is 4°F. 39, at Nice 4°F. 74, at Pisa 5°F. 85, and at Naples 5°F. 08. Whilst there is much equality in the distribution of temperature through the year, there is no less so in the progression of temperature for the day; the mean range for the twenty-four hours being 10°F by the register thermometer, while at Rome it is 10°F at Naples 13°F at Nice 9°F by the common thermometer, which gives only the extremes observed during the day. The steadiness of temperature from day to day also exceeds that of all the other climates. In this respect it is not half so variable as Rome, Nice or Biscay; and is only about one-third as variable as Naples. The degree of variability from day to day at Madeira is 1°F. 11, at Rome 4°F. 89, at Nice 2°F. 33, and at London 4°F. 01. The annual range of atmospheric pressure is also very small, being about the same as that of Rome and Naples. Nearly the same quantity of rain falls annually at Madeira as at Rome, and Florence, but at Madeira there are only 73 days on which any rain falls, while at Naples there are 97, at

Rome
Madera

at Rome 117, and at London 178. The Rain at Madera falls at particular seasons, chiefly in the Autumn, leaving the atmosphere, in general, dry and clear during the remainder of the year. From this comparative view of the Climate, it will be readily perceived, how great an advantage which this island presents over the best climates on the Continent of Europe. It is warmer during the Winter (from its low latitude) and cooler during the summer, from the general evaporation producing the Land breeze. It has less difference between the temperature of day and night, between one season and another, and between successive days; it is almost exempt from keen cold winds, (being as we have stated protected by high mountains at the quarter from which these winds mostly come) and it enjoys a general steadiness of weather, to which the best of these are strangers; the rains are circumscripted, and generally fall at regular and stated periods.

Sir James Macaulay's observations on this subject very nearly agree with Sir James Clark's. He says: The mean annual temperature is 64.5° F. The mean of 3 Winter Months 59.0°, of 3 Spring Months 62.2°.
Madeira

62° 2, of 3 Summer Months 67° 3, of 3 Autumn Months 67° 2. Of February being the Month of lowest temperature 58.5° of August, Month of highest temperature 73°. The difference of the mean temperature of summer and winter thus less than 10° and the difference of the mean of warmest and coldest months only 14°. The extreme range of temperature is probably not more than 40°, nearly 10° of which may be referred to certain hot winds which visit the Island only at rare and uncertain intervals. The mean annual range is not more than 14°, mean of monthly range 18°, of daily range 10° and the extreme of the daily range 17°. Mean difference of temperature of consecutive months 2°.4 and the variation between consecutive days 1°.1

The following is a Table of the Mean height of the Thermometer for every month, taken from an average of four years observations by Richard Nevons in his work on the "Temperature of different Latitudes" together with one drawn from similar observations taken during during a period of 16 years by Mr. Gurney long a Physician resident on the Island given in his work on Madeira Part II.
<table>
<thead>
<tr>
<th></th>
<th>Kirwan</th>
<th>Funkeal</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>64° 18</td>
<td>61°</td>
</tr>
<tr>
<td>February</td>
<td>64° 3</td>
<td>62°</td>
</tr>
<tr>
<td>March</td>
<td>65° 5</td>
<td>61°</td>
</tr>
<tr>
<td>April</td>
<td>65° 5</td>
<td>64°</td>
</tr>
<tr>
<td>May</td>
<td>66° 53</td>
<td>65°</td>
</tr>
<tr>
<td>June</td>
<td>69° 74</td>
<td>66°</td>
</tr>
<tr>
<td>July</td>
<td>73° 45</td>
<td>73°</td>
</tr>
<tr>
<td>August</td>
<td>75° 12</td>
<td>73°</td>
</tr>
<tr>
<td>September</td>
<td>75° 76</td>
<td>72°</td>
</tr>
<tr>
<td>October</td>
<td>72° 5</td>
<td>68°</td>
</tr>
<tr>
<td>November</td>
<td>69° 08</td>
<td>65°</td>
</tr>
<tr>
<td>December</td>
<td>65° —</td>
<td>64°</td>
</tr>
</tbody>
</table>

Is that according to Kirwan's observations the month of September is the warmest, this I should think was rare and was probably owing to some pecu-
linar circumstances occurring, e.g. the diocese.

As a register of the daily state of the Thermometer and Barometer during the winter month, which is a medical point of view are the most important, is useful as well as interesting. I have subjourned and taken by me between 1st November 1839 and 1st July 1840 at Portinha Cottage about thirty
Madura

Thirty feet above the level of the sea in rather a sheltered situation, out of the actual influence of the land, strength of air 87.

<table>
<thead>
<tr>
<th>Day of the Month</th>
<th>Thermometer at 8 A.M.</th>
<th>Thermometer at 8 P.M.</th>
<th>Barometer at 8 A.M.</th>
<th>Barometer at 8 P.M.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>71</td>
<td>71</td>
<td>x</td>
<td>30.10</td>
<td>30.0</td>
</tr>
<tr>
<td>2</td>
<td>71</td>
<td>72</td>
<td>x</td>
<td>29.27</td>
<td>29.90</td>
</tr>
<tr>
<td>3 S</td>
<td>72</td>
<td>72</td>
<td>67½</td>
<td>30.00</td>
<td>30.20</td>
</tr>
<tr>
<td>4</td>
<td>72</td>
<td>7½</td>
<td>68</td>
<td>30.29</td>
<td>30.29</td>
</tr>
<tr>
<td>5</td>
<td>71</td>
<td>71</td>
<td>68</td>
<td>30.29</td>
<td>30.3</td>
</tr>
<tr>
<td>6</td>
<td>71</td>
<td>x</td>
<td>68</td>
<td>30.34</td>
<td>x</td>
</tr>
<tr>
<td>7</td>
<td>7½</td>
<td>72</td>
<td>67</td>
<td>30.21</td>
<td>30.13</td>
</tr>
<tr>
<td>8</td>
<td>71</td>
<td>69</td>
<td>67</td>
<td>29.90</td>
<td>29.86</td>
</tr>
<tr>
<td>9</td>
<td>68</td>
<td>69</td>
<td>66</td>
<td>29.90</td>
<td>30.06</td>
</tr>
<tr>
<td>10 S</td>
<td>72</td>
<td>70</td>
<td>63</td>
<td>30.20</td>
<td>30.21</td>
</tr>
<tr>
<td>11</td>
<td>69</td>
<td>71</td>
<td>64</td>
<td>30.22</td>
<td>30.29</td>
</tr>
<tr>
<td>12</td>
<td>70</td>
<td>69</td>
<td>64</td>
<td>30.27</td>
<td>30.26</td>
</tr>
<tr>
<td>13</td>
<td>70</td>
<td>71</td>
<td>65</td>
<td>30.41</td>
<td>30.40</td>
</tr>
<tr>
<td>14</td>
<td>71</td>
<td>70</td>
<td>63</td>
<td>30.40</td>
<td>30.47</td>
</tr>
<tr>
<td>15</td>
<td>70</td>
<td>68</td>
<td>64</td>
<td>30.40</td>
<td>30.32</td>
</tr>
<tr>
<td>16</td>
<td>69</td>
<td>70</td>
<td>66</td>
<td>30.26</td>
<td>30.18</td>
</tr>
<tr>
<td>17 S</td>
<td>72</td>
<td>71</td>
<td>65</td>
<td>30.14</td>
<td>30.14</td>
</tr>
<tr>
<td>18</td>
<td>74</td>
<td>73</td>
<td>65</td>
<td>30.24</td>
<td>30.34</td>
</tr>
<tr>
<td>Day</td>
<td>Min. Temperature</td>
<td>Max. Temperature</td>
<td>Barometer</td>
<td>Remarks</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Nov 19</td>
<td>19°</td>
<td>30.48</td>
<td>30.48</td>
<td>Fine - Sirocco</td>
<td></td>
</tr>
<tr>
<td>Nov 20</td>
<td>17°</td>
<td>30.55</td>
<td>30.54</td>
<td>Fine - Sirocco</td>
<td></td>
</tr>
<tr>
<td>Nov 21</td>
<td>17°</td>
<td>30.51</td>
<td>30.51</td>
<td>Fine at night Rain</td>
<td></td>
</tr>
<tr>
<td>Nov 22</td>
<td>17°</td>
<td>30.41</td>
<td>30.41</td>
<td>Fine</td>
<td></td>
</tr>
<tr>
<td>Nov 23</td>
<td>17°</td>
<td>30.42</td>
<td>30.35</td>
<td>Fine</td>
<td></td>
</tr>
<tr>
<td>Nov 24</td>
<td>17°</td>
<td>30.38</td>
<td>30.38</td>
<td>Fine</td>
<td></td>
</tr>
<tr>
<td>Nov 25</td>
<td>17°</td>
<td>30.36</td>
<td>30.30</td>
<td>Rain</td>
<td></td>
</tr>
<tr>
<td>Nov 26</td>
<td>17°</td>
<td>30.20</td>
<td>30.17</td>
<td>Rain</td>
<td></td>
</tr>
<tr>
<td>Nov 27</td>
<td>17°</td>
<td>30.16</td>
<td>30.04</td>
<td>Rain</td>
<td></td>
</tr>
<tr>
<td>Nov 28</td>
<td>17°</td>
<td>30.06</td>
<td>30.10</td>
<td>Rainy - Fine</td>
<td></td>
</tr>
<tr>
<td>Nov 29</td>
<td>17°</td>
<td>30.22</td>
<td>30.25</td>
<td>Fine</td>
<td></td>
</tr>
</tbody>
</table>

Thermometer - Max. Temp. in Shade 74° on 19th (Sirocco)
Min. Temp. at Night 39° on 24th 3 days
Barometer - Max. Height 30.55 on 20th (Sirocco)
Min. Height 29.77 on 2nd

| Dec 1 | 69 | 69 | 63.5 | 30.21 | 30.21 | Rain Rainy Fine |
| Dec 2 | 66 | 69 | 61.5 | 30.21 | 30.15 | Rainy |
| Dec 3 | 69 | 69 | 61.4 | 30.19 | 30.19 | Rainy |
| Dec 4 | 65 | 67 | 60 | 30.23 | 30.30 | Rainy |

Climate

Madura
<table>
<thead>
<tr>
<th>Day</th>
<th>Max</th>
<th>Min</th>
<th>Max</th>
<th>Min</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>69</td>
<td>68</td>
<td>62</td>
<td>30.25</td>
<td>30.20</td>
</tr>
<tr>
<td>6</td>
<td>68</td>
<td>68</td>
<td>62</td>
<td>-13</td>
<td>-13</td>
</tr>
<tr>
<td>7</td>
<td>68</td>
<td>67</td>
<td>62</td>
<td>-13</td>
<td>-17</td>
</tr>
<tr>
<td>8</td>
<td>67</td>
<td>66</td>
<td>60</td>
<td>-13</td>
<td>-17</td>
</tr>
<tr>
<td>9</td>
<td>66</td>
<td>64</td>
<td>60</td>
<td>-30</td>
<td>-30</td>
</tr>
<tr>
<td>10</td>
<td>65</td>
<td>66</td>
<td>62</td>
<td>-23</td>
<td>-14</td>
</tr>
<tr>
<td>11</td>
<td>67</td>
<td>68</td>
<td>62.5</td>
<td>-14</td>
<td>-14</td>
</tr>
<tr>
<td>12</td>
<td>70</td>
<td>69</td>
<td>64</td>
<td>-14</td>
<td>-14</td>
</tr>
<tr>
<td>13</td>
<td>68</td>
<td>69</td>
<td>64</td>
<td>-14</td>
<td>-12</td>
</tr>
<tr>
<td>14</td>
<td>68</td>
<td>68</td>
<td>64</td>
<td>-10</td>
<td>29.97</td>
</tr>
<tr>
<td>15</td>
<td>70</td>
<td>70</td>
<td>64</td>
<td>-01</td>
<td>30.20</td>
</tr>
<tr>
<td>16</td>
<td>69</td>
<td>70</td>
<td>63.4</td>
<td>-27</td>
<td>-28</td>
</tr>
<tr>
<td>17</td>
<td>70</td>
<td>68</td>
<td>63</td>
<td>-23</td>
<td>-25</td>
</tr>
<tr>
<td>18</td>
<td>66</td>
<td>68</td>
<td>61</td>
<td>-27</td>
<td>-27</td>
</tr>
<tr>
<td>19</td>
<td>66</td>
<td>66</td>
<td>63</td>
<td>-27</td>
<td>-23</td>
</tr>
<tr>
<td>20</td>
<td>68</td>
<td>68</td>
<td>62</td>
<td>-25</td>
<td>-33</td>
</tr>
<tr>
<td>21</td>
<td>69</td>
<td>69</td>
<td>62</td>
<td>-37</td>
<td>-40</td>
</tr>
<tr>
<td>22</td>
<td>69</td>
<td>69</td>
<td>65</td>
<td>-40</td>
<td>-40</td>
</tr>
<tr>
<td>23</td>
<td>68</td>
<td>70</td>
<td>64</td>
<td>-32</td>
<td>-27</td>
</tr>
<tr>
<td>24</td>
<td>69</td>
<td>69</td>
<td>65</td>
<td>-34</td>
<td>-34</td>
</tr>
<tr>
<td>25</td>
<td>68</td>
<td>68.2</td>
<td>63</td>
<td>-35</td>
<td>-35</td>
</tr>
<tr>
<td>26</td>
<td>69</td>
<td>68</td>
<td>62</td>
<td>-28</td>
<td>-28</td>
</tr>
</tbody>
</table>
### Maderia

**December 1839 (Sept 3)**

<table>
<thead>
<tr>
<th>Day</th>
<th>27</th>
<th>28</th>
<th>29</th>
<th>30</th>
<th>31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>68</td>
<td>66</td>
<td>66</td>
<td>69</td>
<td>68</td>
</tr>
<tr>
<td>Therm.</td>
<td>68</td>
<td>66</td>
<td>69</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Barom.</td>
<td>64</td>
<td>60</td>
<td>62</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>8 A.M.</td>
<td>30.26</td>
<td>—20</td>
<td>—24</td>
<td>—24</td>
<td>—20</td>
</tr>
<tr>
<td>1 P.M.</td>
<td>30.24</td>
<td>—22</td>
<td>—24</td>
<td>—22</td>
<td>—10</td>
</tr>
<tr>
<td>Remarks</td>
<td>Fine</td>
<td>F°</td>
<td>F°</td>
<td>F°</td>
<td>F°</td>
</tr>
</tbody>
</table>

- **Thermometer**: Max. Temp. in Shade 70° on 15th.
- **Min. Temp. at Night**: 57.5 on 10th.
- **Barometer**: Max. Height 30.46 on 22nd.
- **Min. Altitude**: 29.97 on 14th.

---

### January 1840

<table>
<thead>
<tr>
<th>Day</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>68</td>
<td>68</td>
<td>67</td>
<td>66</td>
<td>68</td>
<td>66</td>
<td>67</td>
<td>66</td>
<td>65</td>
<td>64</td>
<td>63</td>
</tr>
<tr>
<td>8 A.M.</td>
<td>63</td>
<td>61</td>
<td>62</td>
<td>60</td>
<td>62</td>
<td>60</td>
<td>59</td>
<td>62</td>
<td>60</td>
<td>62</td>
<td>59</td>
</tr>
<tr>
<td>1 P.M.</td>
<td>30.22</td>
<td>—43</td>
<td>—45</td>
<td>—50</td>
<td>—40</td>
<td>—24</td>
<td>—25</td>
<td>—24</td>
<td>—47</td>
<td>—49</td>
<td>—59</td>
</tr>
<tr>
<td>Remarks</td>
<td>Rain then Fine</td>
<td>Fine</td>
<td>Fine</td>
<td>Very Fine</td>
<td>Fine</td>
<td>Fine</td>
<td>F°</td>
<td>F°</td>
<td>F°</td>
<td>Very Fine</td>
<td>Fine</td>
</tr>
</tbody>
</table>

- **Thermometer**: Max. Temp. in Shade 70° on 15th.
- **Min. Temp. at Night**: 57.5 on 10th.
- **Barometer**: Max. Height 30.46 on 22nd.
- **Min. Altitude**: 29.97 on 14th.
<table>
<thead>
<tr>
<th>Day</th>
<th>Max.</th>
<th>Min.</th>
<th>Mean</th>
<th>Max.</th>
<th>Min.</th>
<th>Mean</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>65</td>
<td>66</td>
<td>66</td>
<td>30.54</td>
<td>30.54</td>
<td>30.54</td>
<td>Fine</td>
</tr>
<tr>
<td>13</td>
<td>66</td>
<td>68</td>
<td>67</td>
<td>30.62</td>
<td>30.62</td>
<td>30.62</td>
<td>Very Fine</td>
</tr>
<tr>
<td>14</td>
<td>67</td>
<td>68</td>
<td>67</td>
<td>30.62</td>
<td>30.62</td>
<td>30.62</td>
<td>So</td>
</tr>
<tr>
<td>15</td>
<td>66</td>
<td>67</td>
<td>66</td>
<td>30.74</td>
<td>30.74</td>
<td>30.74</td>
<td>So</td>
</tr>
<tr>
<td>16</td>
<td>67</td>
<td>66</td>
<td>66</td>
<td>30.74</td>
<td>30.74</td>
<td>30.74</td>
<td>So</td>
</tr>
<tr>
<td>17</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>30.70</td>
<td>30.70</td>
<td>30.70</td>
<td>So</td>
</tr>
<tr>
<td>18</td>
<td>66</td>
<td>67</td>
<td>66</td>
<td>30.63</td>
<td>30.64</td>
<td>30.64</td>
<td>Fine-Rain</td>
</tr>
<tr>
<td>19</td>
<td>67</td>
<td>67</td>
<td>67</td>
<td>30.64</td>
<td>30.64</td>
<td>30.64</td>
<td>Fine</td>
</tr>
<tr>
<td>20</td>
<td>64</td>
<td>65</td>
<td>64</td>
<td>30.72</td>
<td>30.66</td>
<td>30.68</td>
<td>So</td>
</tr>
<tr>
<td>21</td>
<td>64</td>
<td>66</td>
<td>64</td>
<td>30.73</td>
<td>30.73</td>
<td>30.73</td>
<td>So</td>
</tr>
<tr>
<td>22</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>30.70</td>
<td>30.70</td>
<td>30.70</td>
<td>So</td>
</tr>
<tr>
<td>23</td>
<td>63</td>
<td>66</td>
<td>64</td>
<td>30.63</td>
<td>30.63</td>
<td>30.63</td>
<td>So</td>
</tr>
<tr>
<td>24</td>
<td>67</td>
<td>66</td>
<td>66</td>
<td>30.60</td>
<td>30.60</td>
<td>30.60</td>
<td>So</td>
</tr>
<tr>
<td>25</td>
<td>65</td>
<td>67</td>
<td>66</td>
<td>30.64</td>
<td>30.64</td>
<td>30.64</td>
<td>So</td>
</tr>
<tr>
<td>26</td>
<td>67</td>
<td>68</td>
<td>67</td>
<td>30.61</td>
<td>30.63</td>
<td>30.62</td>
<td>So</td>
</tr>
<tr>
<td>27</td>
<td>67</td>
<td>68</td>
<td>67</td>
<td>30.58</td>
<td>30.62</td>
<td>30.60</td>
<td>So</td>
</tr>
<tr>
<td>28</td>
<td>66</td>
<td>66</td>
<td>66</td>
<td>30.59</td>
<td>30.54</td>
<td>30.56</td>
<td>So</td>
</tr>
<tr>
<td>29</td>
<td>67</td>
<td>x</td>
<td>67</td>
<td>30.53</td>
<td>x</td>
<td>30.53</td>
<td>So</td>
</tr>
<tr>
<td>30</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>30.50</td>
<td>30.54</td>
<td>30.52</td>
<td>So</td>
</tr>
<tr>
<td>31</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>30.44</td>
<td>30.50</td>
<td>30.47</td>
<td>So</td>
</tr>
</tbody>
</table>

Thermometer Max. Temp. in Shade 70°F on 1st

Min. Temp. at Night 57°F on 21st & 28th

Barometer Max. Alt. 30.74 on 15th & 16th

Min. Alt. 30.22 on 1st
<table>
<thead>
<tr>
<th>Day of the Week</th>
<th>Temperature (°F)</th>
<th>Thermometer at 6 A.M.</th>
<th>Weather Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>64</td>
<td>58</td>
<td>30.35</td>
</tr>
<tr>
<td>2</td>
<td>65</td>
<td>57.5</td>
<td>31.35</td>
</tr>
<tr>
<td>3</td>
<td>66</td>
<td>61</td>
<td>41</td>
</tr>
<tr>
<td>4</td>
<td>66</td>
<td>61</td>
<td>49</td>
</tr>
<tr>
<td>5</td>
<td>66</td>
<td>60</td>
<td>53</td>
</tr>
<tr>
<td>6</td>
<td>67</td>
<td>61</td>
<td>56</td>
</tr>
<tr>
<td>7</td>
<td>68</td>
<td>60</td>
<td>54</td>
</tr>
<tr>
<td>8</td>
<td>68</td>
<td>60</td>
<td>44</td>
</tr>
<tr>
<td>9</td>
<td>66</td>
<td>59</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>66</td>
<td>60</td>
<td>38</td>
</tr>
<tr>
<td>11</td>
<td>65</td>
<td>59</td>
<td>40</td>
</tr>
<tr>
<td>12</td>
<td>65</td>
<td>56</td>
<td>38</td>
</tr>
<tr>
<td>13</td>
<td>66</td>
<td>59</td>
<td>42</td>
</tr>
<tr>
<td>14</td>
<td>64</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>15</td>
<td>64</td>
<td>59</td>
<td>20</td>
</tr>
<tr>
<td>16</td>
<td>64</td>
<td>58</td>
<td>20</td>
</tr>
<tr>
<td>17</td>
<td>65</td>
<td>58</td>
<td>20</td>
</tr>
<tr>
<td>18</td>
<td>64</td>
<td>58</td>
<td>36</td>
</tr>
<tr>
<td>19</td>
<td>66</td>
<td>57</td>
<td>36</td>
</tr>
<tr>
<td>20</td>
<td>64</td>
<td>57</td>
<td>33</td>
</tr>
<tr>
<td>21</td>
<td>65</td>
<td>60</td>
<td>21</td>
</tr>
<tr>
<td>22</td>
<td>64</td>
<td>63</td>
<td>10</td>
</tr>
</tbody>
</table>

**Madeira, February 1840**

**Climate**

*Remarks:
- Fine
- So
- Rain at Night
- Very Fine
- So
- Fine
- So
- Fine
- So
- Fine
- So
- So
- So
- So
- So
- So
- So
- So
- So
- So
- So
- So*
### Madeira

**February 1840 (Cont.)**

<table>
<thead>
<tr>
<th>Day</th>
<th>Temp.</th>
<th>Max.</th>
<th>Min.</th>
<th>Barometer</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>64</td>
<td>57</td>
<td>30.0</td>
<td>29.97</td>
<td>Fine</td>
</tr>
<tr>
<td>24</td>
<td>65</td>
<td>61</td>
<td>29.97</td>
<td>30.07</td>
<td>Stormy</td>
</tr>
<tr>
<td>25</td>
<td>66</td>
<td>61</td>
<td>30.12</td>
<td>30.10</td>
<td>So</td>
</tr>
<tr>
<td>26</td>
<td>65</td>
<td>60.7</td>
<td>30.09</td>
<td>29.96</td>
<td>SW wind</td>
</tr>
<tr>
<td>27</td>
<td>63</td>
<td>57</td>
<td>29.93</td>
<td>30.0</td>
<td>Drizzly</td>
</tr>
<tr>
<td>28</td>
<td>65</td>
<td>59</td>
<td>30.05</td>
<td>30.00</td>
<td>Fine</td>
</tr>
<tr>
<td>29</td>
<td>65</td>
<td>59</td>
<td>30.10</td>
<td>30.06</td>
<td>Fine</td>
</tr>
</tbody>
</table>

**Thermometer max. Temp. in shade 68° on 7th.**

**Min. Temp. at night 56° on 12th.**

**Barometer - Max. alt. 30.56 on 6th.**

**Min. alt. 29.93 on 27th.**

---

**March 1840**

<table>
<thead>
<tr>
<th>Day</th>
<th>Temp.</th>
<th>Max.</th>
<th>Min.</th>
<th>Barometer</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>64</td>
<td>56.5</td>
<td>30.20</td>
<td>30.22</td>
<td>Drizzly</td>
</tr>
<tr>
<td>2</td>
<td>61</td>
<td>63</td>
<td>-22</td>
<td>-31</td>
<td>Fine</td>
</tr>
<tr>
<td>3</td>
<td>62</td>
<td>63</td>
<td>-32</td>
<td>-34</td>
<td>Gloomy</td>
</tr>
<tr>
<td>4</td>
<td>62</td>
<td>63</td>
<td>-25</td>
<td>-18</td>
<td>Gloomy</td>
</tr>
<tr>
<td>5</td>
<td>64</td>
<td>61</td>
<td>-18</td>
<td>29.97</td>
<td>Stormy</td>
</tr>
<tr>
<td>6</td>
<td>65</td>
<td>60</td>
<td>29.88</td>
<td>30.05</td>
<td>Fine</td>
</tr>
<tr>
<td>7</td>
<td>65</td>
<td>67.5</td>
<td>30.16</td>
<td>-21</td>
<td>Rain - then Fine</td>
</tr>
<tr>
<td>8</td>
<td>63</td>
<td>65</td>
<td>-34</td>
<td>-38</td>
<td>Fine</td>
</tr>
<tr>
<td>9</td>
<td>63</td>
<td>64</td>
<td>-38</td>
<td>-36</td>
<td>Fine</td>
</tr>
<tr>
<td>Day of the Month</td>
<td>Temperature</td>
<td>Barometer</td>
<td>Remarks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------</td>
<td>-----------</td>
<td>------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>62</td>
<td>57</td>
<td>30.35 30.20 Rain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>62</td>
<td>56</td>
<td>-0.17 -0.09 Rain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>61</td>
<td>56</td>
<td>-0.03 -0.00 Rain Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>63</td>
<td>58</td>
<td>-0.07 -0.07 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>62</td>
<td>55</td>
<td>-0.07 -0.07 Rainy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>62</td>
<td>56</td>
<td>-0.07 -0.11 Rainy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>64</td>
<td>57</td>
<td>-0.14 -0.14 Windy but Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>62</td>
<td>56</td>
<td>-0.22 -0.22 Very Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>64</td>
<td>57</td>
<td>-0.21 -0.06 Rain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>63</td>
<td>55</td>
<td>-0.06 -0.03 Rain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>64</td>
<td>56</td>
<td>-0.14 -0.28 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>66</td>
<td>57</td>
<td>-0.30 -0.34 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>66</td>
<td>61</td>
<td>-0.34 -0.35 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>64</td>
<td>63</td>
<td>-0.32 -0.26 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>64</td>
<td>59</td>
<td>-0.21 -0.1 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>65</td>
<td>59</td>
<td>-0.11 -0.1 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>67</td>
<td>59</td>
<td>-0.05 -0.05 Windy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>65</td>
<td>59</td>
<td>-0.05 -0.04 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>62</td>
<td>55</td>
<td>-0.17 -0.1 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>61</td>
<td>59</td>
<td>-0.25 -0.25 Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>61</td>
<td>56</td>
<td>-0.22 -0.19 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>62</td>
<td>53</td>
<td>-0.20 -0.20 50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Madeira, March 1840)
### Madeira

#### March 1840 (Cont.)

Thermometer - Max. Temp. in shade 67° on 26th

Min. Temp. Straight 53° on 29th

Barometer - Max. Alt. 30.38 on 9th

Min. Alt. 29.88 on 6th

#### April 1840

<table>
<thead>
<tr>
<th>Day</th>
<th>Max.</th>
<th>Min.</th>
<th>Barometer Max.</th>
<th>Barometer Min.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>64</td>
<td>56</td>
<td>30.09</td>
<td>30.16</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>64</td>
<td>55</td>
<td>-16</td>
<td>-16</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>62</td>
<td>54.2</td>
<td>-06</td>
<td>-10</td>
<td>Good</td>
</tr>
<tr>
<td>4</td>
<td>62</td>
<td>56</td>
<td>-13</td>
<td>-20</td>
<td>Good</td>
</tr>
<tr>
<td>5</td>
<td>63</td>
<td>57</td>
<td>-31</td>
<td>-31</td>
<td>Good</td>
</tr>
<tr>
<td>6</td>
<td>63</td>
<td>56</td>
<td>-30</td>
<td>-31</td>
<td>Rain and Fine</td>
</tr>
<tr>
<td>7</td>
<td>62</td>
<td>56</td>
<td>-30</td>
<td>-38</td>
<td>Drizzly</td>
</tr>
<tr>
<td>8</td>
<td>62</td>
<td>56</td>
<td>-44</td>
<td>-44</td>
<td>Good</td>
</tr>
<tr>
<td>9</td>
<td>62</td>
<td>54.5</td>
<td>-44</td>
<td>-41</td>
<td>Rain</td>
</tr>
<tr>
<td>10</td>
<td>62</td>
<td>59</td>
<td>-41</td>
<td>-41</td>
<td>Rain</td>
</tr>
<tr>
<td>11</td>
<td>62</td>
<td>57</td>
<td>-41</td>
<td>-35</td>
<td>Rain</td>
</tr>
<tr>
<td>12</td>
<td>63</td>
<td>57</td>
<td>-31</td>
<td>-38</td>
<td>Very Fine, Last Snow</td>
</tr>
<tr>
<td>13</td>
<td>63</td>
<td>58</td>
<td>-28</td>
<td>-34</td>
<td>Fine</td>
</tr>
<tr>
<td>14</td>
<td>64</td>
<td>57</td>
<td>-31</td>
<td>-31</td>
<td>Fine</td>
</tr>
<tr>
<td>15</td>
<td>62</td>
<td>57</td>
<td>-32</td>
<td>-28</td>
<td>Drizzly</td>
</tr>
<tr>
<td>16</td>
<td>63</td>
<td>58</td>
<td>-14</td>
<td>-24</td>
<td>Drizzly</td>
</tr>
<tr>
<td>Date</td>
<td>Max.</td>
<td>Min.</td>
<td>Mean</td>
<td>1st Hr.</td>
<td>2nd Hr.</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>17</td>
<td>63</td>
<td>57</td>
<td>60</td>
<td>30.29</td>
<td>30.26</td>
</tr>
<tr>
<td>18</td>
<td>61</td>
<td>56</td>
<td>58</td>
<td>-1.26</td>
<td>-1.42</td>
</tr>
<tr>
<td>19</td>
<td>64</td>
<td>56</td>
<td>59</td>
<td>-1.43</td>
<td>-1.33</td>
</tr>
<tr>
<td>20</td>
<td>63</td>
<td>60</td>
<td>-32</td>
<td>-1.34</td>
<td>-1.40</td>
</tr>
<tr>
<td>21</td>
<td>64</td>
<td>59</td>
<td>-39</td>
<td>-1.36</td>
<td>-1.37</td>
</tr>
<tr>
<td>22</td>
<td>65</td>
<td>58</td>
<td>-36</td>
<td>-1.36</td>
<td>-1.87</td>
</tr>
<tr>
<td>23</td>
<td>65</td>
<td>58</td>
<td>-36</td>
<td>-1.36</td>
<td>-1.87</td>
</tr>
<tr>
<td>24</td>
<td>65</td>
<td>58</td>
<td>-36</td>
<td>-1.36</td>
<td>-1.87</td>
</tr>
<tr>
<td>25</td>
<td>66</td>
<td>60</td>
<td>-39</td>
<td>-1.40</td>
<td>-1.37</td>
</tr>
<tr>
<td>26</td>
<td>64</td>
<td>60</td>
<td>-38</td>
<td>-1.37</td>
<td>-1.37</td>
</tr>
<tr>
<td>27</td>
<td>65</td>
<td>65</td>
<td>58.4</td>
<td>-33</td>
<td>-33</td>
</tr>
<tr>
<td>28</td>
<td>64</td>
<td>57</td>
<td>-24</td>
<td>-1.36</td>
<td>-1.36</td>
</tr>
<tr>
<td>29</td>
<td>65</td>
<td>60</td>
<td>50.3</td>
<td>-10</td>
<td>-1.05</td>
</tr>
<tr>
<td>30</td>
<td>64</td>
<td>55.5</td>
<td>-10</td>
<td>-1.05</td>
<td>-1.10</td>
</tr>
</tbody>
</table>

Thermometer: Max. Temp. in shade 67° - after 6: Min. Temp. at night 56° - 6:00

Barometer: Max. Alt. 30.425 on 19th Feb. 30.05 on 29th.

May 1840

1 | 66 66 | 59 | 30.10 | 30.00 | Rainy
2 | 65 64 | 57.5 | -0 | 30.20 | Windy
### Madeira

<table>
<thead>
<tr>
<th>Day of the Month</th>
<th>Thermometer (°F)</th>
<th>Hygrometer (°F)</th>
<th>Barometer (in Hg)</th>
<th>Weather</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>64</td>
<td>66</td>
<td>58</td>
<td></td>
<td>Drippy</td>
</tr>
<tr>
<td>4</td>
<td>67</td>
<td>67</td>
<td>62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>66</td>
<td>68</td>
<td>61.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>67</td>
<td>67</td>
<td>61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>67</td>
<td>67</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>67</td>
<td>69</td>
<td>61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>67</td>
<td>68</td>
<td>63.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>68</td>
<td>68</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>68</td>
<td>68</td>
<td>63.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>68</td>
<td>70</td>
<td>62.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>69</td>
<td>69</td>
<td>63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>68</td>
<td>70</td>
<td>64.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>68</td>
<td>70</td>
<td>66.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>69</td>
<td>70</td>
<td>63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>70</td>
<td>69</td>
<td>62.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>68</td>
<td>67</td>
<td>61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>67</td>
<td>67</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>67</td>
<td>67</td>
<td>62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>67</td>
<td>67</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>68</td>
<td>68</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>68</td>
<td>69.3</td>
<td>61.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>69</td>
<td>70</td>
<td>66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**
- 1. Fine (Rain in Oct.)
- Fine
- Rain
- Fine (Light Wind)
- Very Fine
- Fine
- So
- So
- So
- So - Cloudy
- So - Cloudy
- Very Fine
- So
- So
- So
- So
- Fine - Strong NE wind (A perfect hurricane, trees all bent, several houses unroofed and many in all then dined)
- Rather Cold Wind
<table>
<thead>
<tr>
<th>Day of the Month</th>
<th>Temperature at 8 a.m.</th>
<th>Temperature at 4 p.m.</th>
<th>Barometer at 8 a.m.</th>
<th>Barometer at 4 p.m.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>70</td>
<td>72</td>
<td>65</td>
<td>30.24</td>
<td>30.25</td>
</tr>
<tr>
<td>26</td>
<td>70.4</td>
<td>70</td>
<td>65.3</td>
<td>31.24</td>
<td>31.24</td>
</tr>
<tr>
<td>27</td>
<td>70.4</td>
<td>71</td>
<td>64</td>
<td>29.25</td>
<td>29.25</td>
</tr>
<tr>
<td>28</td>
<td>70</td>
<td>71</td>
<td>65</td>
<td>31.36</td>
<td>31.36</td>
</tr>
<tr>
<td>29</td>
<td>70.6</td>
<td>71</td>
<td>62</td>
<td>29.46</td>
<td>29.46</td>
</tr>
<tr>
<td>30</td>
<td>70</td>
<td>71</td>
<td>65</td>
<td>31.44</td>
<td>31.44</td>
</tr>
<tr>
<td>31</td>
<td>70</td>
<td>70</td>
<td>64.8</td>
<td>28.28</td>
<td>28.28</td>
</tr>
</tbody>
</table>

**Remarks:**
- Fine but still hazy
- Fine
- Cloudy
- Low and dense
- Fine
- So
- So
- So
- So

**Thermometer:**
- Max. Temp. is Made 72° on 20th
- Min. Temp. at night. 57.3 on 20th

**Barometer:**
- Max = Alt. = 30.48 on 26th
- Min = Alt. = 30.00 on 20th

---

<table>
<thead>
<tr>
<th>Day of the Month</th>
<th>Temperature at 8 a.m.</th>
<th>Temperature at 4 p.m.</th>
<th>Barometer at 8 a.m.</th>
<th>Barometer at 4 p.m.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70</td>
<td>72</td>
<td>64.4</td>
<td>30.28</td>
<td>30.28</td>
</tr>
<tr>
<td>2</td>
<td>70</td>
<td>70</td>
<td>65</td>
<td>29.29</td>
<td>29.29</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>70</td>
<td>65</td>
<td>30.30</td>
<td>30.30</td>
</tr>
<tr>
<td>4</td>
<td>69</td>
<td>69</td>
<td>65</td>
<td>25.25</td>
<td>25.25</td>
</tr>
<tr>
<td>5</td>
<td>67</td>
<td>69</td>
<td>65.6</td>
<td>21.21</td>
<td>21.21</td>
</tr>
<tr>
<td>6</td>
<td>68.5</td>
<td>69</td>
<td>63</td>
<td>24.34</td>
<td>24.34</td>
</tr>
<tr>
<td>7</td>
<td>69</td>
<td>68</td>
<td>64.4</td>
<td>38.38</td>
<td>38.38</td>
</tr>
<tr>
<td>8</td>
<td>67</td>
<td>68</td>
<td>61.4</td>
<td>43.43</td>
<td>43.43</td>
</tr>
<tr>
<td>9</td>
<td>69</td>
<td>69</td>
<td>63</td>
<td>44.44</td>
<td>44.44</td>
</tr>
</tbody>
</table>

**Remarks:**
- Fine - Very hazy
- So
- So
- So
- So
- So
- So
- So
- So
<table>
<thead>
<tr>
<th>Day of the</th>
<th>Temperature</th>
<th>Barometric</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barometer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>62.4</td>
<td>30.42</td>
<td>Fair but hot</td>
</tr>
<tr>
<td></td>
<td>61</td>
<td>-34</td>
<td>Cloudy</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>-34</td>
<td>Fair</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>-39</td>
<td></td>
</tr>
<tr>
<td></td>
<td>66</td>
<td>-42</td>
<td></td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>-40</td>
<td>Very fine, Very hot</td>
</tr>
<tr>
<td></td>
<td>66</td>
<td>-40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>66</td>
<td>-40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>-40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>-37</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>-33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>-23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>-26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>-22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>-22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>69.2</td>
<td>-22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>-22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>-22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>-19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>-36</td>
<td></td>
</tr>
<tr>
<td></td>
<td>67.5</td>
<td>-40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>-38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>-32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>65.4</td>
<td>-32</td>
<td></td>
</tr>
</tbody>
</table>

Finis
Madeira
June 1840 (Cont.)

Thermometer. Max. Temp. in Shade 75° on 22nd
- Min. Temp. at Night 61° on 11th
Barometer. Max. Alt. 30.47 on 9th
- Min. Alt. 30.19 on 25th

In the "Encyclopedia Metropolitana," (art. Meteorology), the following Table is given, purporting to be the result of at least 800 observations.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Funchal.</td>
<td>32°37'16&quot;N</td>
<td>68.54</td>
<td>64.40</td>
<td>65.64</td>
<td>72.59</td>
<td>65.64</td>
</tr>
</tbody>
</table>
|               | 32°32'55"N | 67.56      | 64.04       | 66.52         | 72.32         | 65.55         | 11.52

From the preceding Table and remarks, one would be very apt at first to think that the heat in Madeira can never be very oppressive; but this would be a very erroneous conclusion to come to. I am not now alluding to the two or three during which the trade winds blow, for this occurs only at considerable and irregular periods, and being a specific cause should not be taken into the general account; but I allude to the usual continued weather, for let us keep in mind, that the Body is most affected by long continued action, whether of Heat or Cold as well as many other...
Madeira

Other matters, thus we all know, that surgeons in reducing a dislocation, do not apply the traction on the displaced limb suddenly, but gradually and continuously, in order to produce relaxation of the parts and to overcome the power of the muscles, which prevent the limb from being replaced in proper line; in the same way those who reside for some time, say three or four months, in Madeira or any warm place, feel the heat of hummed very oppressive, for the body loses its tone, the tissues become relaxed and soft, and one feels totally unfit for any employment whatsoever, walking to any distance is out of the question, even reading becomes wearisome, and in fact sleeping and drinking are the only pleasant occupations. This refers however chiefly to the Town aerated, and without the feeling of general apathy to all the ordinary occupations of life is greatly augmented from the circumstanced nature of the locality, which after a time offers no new scene, no new objects of interest, at what that variety which is desirable and which I believe is necessary for the Body and Mind to retain their full vigor, cannot be obtained. The Eiroco or "L'Eto," an evident cause for the oppressive...
Madeira

Climate

Oppressive heat, occurs chiefly in summer, at intervals of about six weeks or two months, and generally lasts about three days, during which time the thermometer rises to 80°, 100° and even 120° in the shade.

The division of the year into four seasons is not well marked, for as in truly Tropical Climates there are only two distinct seasons - the Dry and the Rainy season. The existence of Spring is known chiefly by the budding of the Vegetation and has few of those charms belonging peculiarly to Temperate Climates. The transition into Summer is almost immediate and is characterized by the prevalence of the N.E. Winds, which with the Northerly and East winds prevail on the Island; perhaps two hundred days in the year may be noted as between the N.E. and N.W. Points, and about fifty more due East. From this it is obvious that the Island is within those limits in which the Trade Winds blow with undiscernable regularity. Occasionally they are violent irregular winds (usually from the SW) which do considerable damage to the vineyards and the Ferry. The hurricanes are however of rare occurrence. (Sir James M'Gillivray Op. cit. p.27)

The Rainy season of Madeira may be said to comprehend
Madeira

comprehend the months of October, November, December, January and February; — although the intervals of fair weather, during the two former months, generally exceed the periods of rain. This season is ushered in by the cessation of the North East breeze, frequent calms, a prevalence of westerly winds at first, and of south and south west, sometimes amounting to gales, afterwards. Thus all the situated within the Temperate Zone and therefore subjected to a great number of perturbing causes, yet from the vicinity of Madeira to the Equinoctial Zone we are enabled to recognize the influence of the same laws which regulate the setting in of this season in the regions of the Tropic Zone. It has been submitted by one of the first authorities on these subjects (Dr. Humboldt) that whilst the N.E. breeze prevails, it prevents the air which descends on the equinoctial seas and regions from being saturated with humidity; the ascending current of heated and humid air being regularly displaced below by dryer and colder currents from the north; but when this breeze ceases, the columns of air are no longer displaced or renewed and consequently the humidity is accumulated to saturation. The North East breeze being created by the difference of...
Madeira

Temperature between adjoining regions, abate of course in proportion as that difference of temperature diminishes; now the month in which the temperature of Madeira differs least from that of the region a band of 30° N. is September, at the end of which, the first rains and westerly winds generally occur.

"The diacce, says Bowdich, is experienced here in a slight degree, and always arrives from the eastward, hence the natives call it "L'Este," from Cape Verde to Cape Palmas in Africa its direction under the name of "Harmattan" is N.E., but from the latter place to Benin E.N.E. In Egypt it is called Ramsis and flows from S.S.W. The dust, troubled appears and of the sun and sky, the fine dust pervading the air, the dryness of the skin, espeially that of the lips and nose as if affected by a severe cold, the curling up of Bokhs and Caps and the wide gaping of the seams of all boarded floors are the attendant circumstances both of the Harmattan, Ramsis & diacce."

In Madeira I have noticed a peculiar phenomenon which is characteristic of the near approach of the diacce, viz. that the summits of the Mountains...
and the atmosphere immediately above them, appeared peculiarly dead and distinct, and the distance between the eye and the hills appears greatly diminished, but at a short distance below the outline of hill-tops, a diffused, semitransparent, milk-coloured, smoky-looking vapour is rising, and sometimes shifting about, and then disappearing. I noticed this appearance in February, every instance, the afternoon before the "l'Este" set in, and at first mistook it for misted, which is often seen on the mountains, caused by the presence of the sun on the mountains, caused by the presence of the sun setting near to the moon and the bushes in order to enrich the land with their ashes.

Rather a curious effect of the deep, semicircular form of the Bay of Funchal, is, that when the N.E. wind is blowing outside the bay, the inner current after a time turns inland, becoming first S.W. then W, then S. to S.E., thus rejoining the main current against a little beyond the "Bezas Head", but its rapidity during this circulation, being much diminished. An illustration of this phenomenon, I may perhaps be allowed to relate an incident that happened here during the American War - An American Letter of marque had
Bay of Funchal.
Madeira

had been cruising for a considerable time off Madeira and had captured one or two small British merchantmen. One forenoon the entrance of the bay was observed and was sailing leisurely along with this Bay-Wind, when a large clumsy looking English Frigate, appeared to the South-East, outside the bay; the Esmeralda made all sail to get out of the bay in order to cut off the vessel, but in consequence of the different velocity of the inner and outer currents of wind, before she could get out, the English Frigate which he now to his consternation, discovered to be a disguised Esmeralda, had gained so much upon him, that the Esmeralda was obliged to give herself up as a prize after a few shots had been exchanged.

(The opposite cough sketches may perhaps serve to illustrate this more clearly - the arrows showing the directions of the currents of wind.)

The Earnings and Nights of Madeira are the most delightful parts of the day; the air is then most refreshing, being warm without causing oppression and the silvery brilliancy of the Queen of the Night where shining, surpasses anything of the kind we ever saw in Britain, the delicious, delicate fragrance of
Madeira

of the orange & sesameine blossoms and other plants is therewith perceptible, and on a calm, still night to view the Bay, sparkling in the brilliant moonlight, whilst music of various kinds still more oftend the sound embellished at intervals by the “Alta Alta” of the lutes, bells and into an enchantment of the purest delight, to be conceived only by those who have experienced it.

No good series of magnetic observations regarding the climate of Funchal have been made and the only Magnetic ones I had acquaint with are those of Bowdich, the results of which are that the greatest variation is at 8 A.M. and the least at 2 A.M. and that the variation decreases with the temperature, being least in the coldest season. The following is a Table of the Variation of the Compass.

<table>
<thead>
<tr>
<th>Year</th>
<th>Compass</th>
<th>Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1720</td>
<td>4° W</td>
<td>8° 15'</td>
</tr>
<tr>
<td>1758</td>
<td>Howe</td>
<td>15° 12'</td>
</tr>
<tr>
<td>1761</td>
<td>Bishop</td>
<td>16°</td>
</tr>
<tr>
<td>1769</td>
<td>Flewitt</td>
<td>15°</td>
</tr>
<tr>
<td>H.M.S. Lowestoff</td>
<td>16° 30'</td>
<td></td>
</tr>
<tr>
<td>1788</td>
<td>Johnston</td>
<td>18°</td>
</tr>
<tr>
<td>1825</td>
<td>Bowdich</td>
<td>22° 15'</td>
</tr>
</tbody>
</table>
**Madeira**

Bowditch makes the maximum of the Barometer to correspond to 8 ½ A. M. and the minimum to 3 P. M. at Madeira; and he says (page 131), "I do not think the mean of the annual quantity of rain which falls in Madeira can be far short of 40 inches. The heaviest he saw was in January (24th) 0.96 in. in five hours, and in the whole of January with a Robed Oleometric (to prevent evaporation) 13.2 inches. Dr. Heinrich however considers the mean annual quantity of rain as only 25.026 inches, and gives the following table of the mean monthly quantities of rain in inches:

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainy days</th>
<th>Interdays</th>
<th>Rainy days</th>
<th>Interdays</th>
<th>Rainy days</th>
<th>Interdays</th>
<th>Rainy days</th>
<th>Interdays</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>3.217</td>
<td>15</td>
<td>6</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>1.757</td>
<td></td>
<td>7</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>1.510</td>
<td>9</td>
<td>6</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>1.520</td>
<td>2</td>
<td>7</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>1.072</td>
<td>8</td>
<td>6</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>0.347</td>
<td>1</td>
<td>17</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>0.372</td>
<td>3</td>
<td>8</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>0.405</td>
<td></td>
<td>8</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>1.067</td>
<td>11</td>
<td>10</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>2.082</td>
<td>7</td>
<td>5</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>8.577</td>
<td>17</td>
<td>3</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>3.100</td>
<td>6</td>
<td>13</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Madeira

For more minute tabulated information, reference may well be made to Sir James Clark's admirable work on "The Sanative Influence of Climate" (3rd Edn. 1841), at the end of which copious comparative Tables are given, but the preceding sufficiently illustrate the subject at present under consideration, and having now concluded the account of the Climate, let us consider whether Invalids in resorting to Madeira for the benefit of their health, really attain their desired object.

Unfortunately, it is much to be regretted, that many resort to Madeira only after Consumption has had its almost unrestrained effect upon the Constitution for a considerable time, even for years, in many cases having existed congenitally; removal to a warmer is often only then suggested as a sort of dernier coup; the poor patient and his friends grasp at any aid however slender, for support, and thus they choose what in many instances is the most flimsy of cotton cords. I have seen unfortunate sufferers from this most dreadful malady, who were unable without assistance to move from one chair to
another, actually sent from considerable distances on board of sailing vessels bound to Madeira, without even so much as a servant to attend to their absolute wants, and perhaps their only friend on board being introduced for the first time on the patient entering the ship for departure from his native shores. He leaves bond, he leaves all his accustomed comforts, he leaves his dear relatives and friends, to be bowed upon the humanity and kindness of absolute strangers, to live probably upon a total change of diet and regimen, and what is far worse, he runs the chance, if not the certainty, of sleeping on badly aired, if not damp sheets, and must be subjected and submitted to all the inconveniences of board-ship life—have scarcely room to turn in his berth, where before he may have been used to the comfort of a large bed and well aired room. It is not absolute, unjustifiable cruelty to permit such sufferers, who are often perfectly unaware of the inconveniences, necessarily attending travelling particularly on ship-board, to bear their fate. What is the consequence of such a treatm-
Madeira

That many have their bodies consigned to the
waves, are they have been a week on board.
This cruel measure is frequently adopted merely
to gratify the wishes of the unfortunate patient
or those of his friends, who are, naturally enough
anxious to leave nothing undone, in their state
for means of relief; but generally speaking the
suffered himself has little to say in the arrange-
ment, and it is principally in obedience to
medical advice, that he undertakes a voyage
productive of nothing but mischief and disap-
pointment. No unusual share of suffering is
necessary to detect confirmed consumption, and
still less is requisite in forming an opinion as
'to the result. What object then can a practitioner
have in view in sending invalids abroad, in
such hopeless circumstances?" Happily this
is not so much the custom now as when St-
cton made the above remarks in 1826 but still
the practice is far too common.

To show the benefit resulting to threatened
and aggravated cases of Consumption and also
to prove how many are sent out when their cases
are perfectly hopeless and therefore unjustifiable
Madeira

I give the following interesting table the one from the results of eight years practice previous to 1826, the other between the 1st January 1838 and 31st May 1840, both by Dr. Rantonio.

**1826**

Cases of Confirmed Phthisis 47
Of these died within 6 months after their arrival at Madeira. ------- 32
First home in summer, returned and died. -- 6
Left the Island, twice dead, ------ 6
Not heard of, probably dead ------ 3
Total 47

Cases of Incipient Phthisis 35
Left Island much improved and if seen there was good account --- 26
Also improved, but not seen dead if. --- 5
Have since died --- 4
Total 35

**1840**

With Tuberculous Lungs 56
Died in Madeira ------ 30
Left Island ------ 22
Still here ------ 4
Total 56
Table 27. Threatened with Pulmonary Disease 108
Remained free from symptoms 93
Fall off 13
Lost sight of 2
Total 108

Thus Dr. Bentin remarks it is evident "that great and lasting benefits is to be derived from a temporary residence in this climate, which is probably inferior to six other in cases where pulmonary disease is merely threatened, or where strong family predisposition to it exists, many living examples sufficiently prove. But even under such comparatively favorable circumstances, it ought to be strongly impressed on the mind of the invalid, that half measures are worse than useless, and that no advantage is to be derived from climate, however fine, unless it be supported by the utmost caution and prudence on his part."

Of the "living examples above mentioned I myself know many cases, one of whom particularly occurs to my memory. A gentleman from the Cord arranged in Madeira in 1831 apparently in
Madeira

The last stage of Consumption, his friends had not expected to see him live a week, he was invited to reside at a British House near the sea shore, here he gradually improved and has not got as well that he is able to go through any active business, but I believe we should attribute his great improvement to a constant residence on the Island, for several years, for I am convinced that a great number of invalids who go there and improve the first winter, by leaving the Island to early in spring or even at all, do away with all the beneficial effects of their winter residence, and I perfectly agree with Dr. Heineman's opinion that those who wish really to improve in health should remain in Madeira during the summer also, for in summer, consumptive patients almost invariably gain ground, whilst in winter several cases may be well satisfied if they do not retrograde, some may object that I myself state that the health in summer is very oppressive, but I have also said that by ascending the Mountains, any temperature, of course within certain limits, may be obtained, and the only objection to the coast, is the want of recreation.
Madiera

conduring the invalid state, I would recommend
him in order to relieve the irritation, if he can
not withstand it, to take a sea trip to the Cana-
ties, Azores, Gibraltar or even Lisbon, but to go
as far north— a constant residence on the
Island however is best for the most safe measure
to adopt.

There is another class of cases, in which, I
believe a residence on the Island would be
of great service. I mean in those instances
whend the disease, of whatever inflammatory
nature connected with the Lungs or neigh-
bouring organs, exists hereditarily. I have known
several instances where children thus predis-
posed and have gone to Madiera at an early
age (not too early) have returned most won-
derfully improved, but in all instances it
must be borne in mind, that the consti-
tution of such patients is naturally feeble and
that time is necessary to overcome the morbid
tendency existing in their body, at the same
time we must endeavor to raise the tone
and vigour of the body, by exercise, particular-
ly on horseback, by cold bathing with sea

water
Madeira

Sea-water, friction &c., keeping the whole body covered, but not too warmly dressed with flannel, and paying most particular attention to the state of the bowels and skin; at the same time warning and suffered to keep out of draughts, to avoid too great or overheating exercise, or any cause of great bodily or mental excitement; not to expose himself to the night air, or to damp or wet weather, but to wait till the land breeze for some time and has warmed the atmosphere and dispelled any humidity; and lastly to be careful to avoid eating too much fruit, or unripe fruit, as this might bring on a fit of dysentery, which not only very considerably weakens the sufferers, but curious to say, seems to render them very liable to disorders connected with the liver. I have known many, who had attacks of dysentery who were very subject to bilious attacks for long afterwards; and this would be a very unmanageable complication.

I have said, that Children who are hereditarily disposed to diseases of the Chest, ought not to be sent to Madeira at too early an age, for when too young, say, till they are ten years old,
Madura

The warmth of the Climate rather debilitating, and by the time they have grown up and have stayed long enough to render it probable that the tendency to morbid action has been overcome, they have become so accustomed to the warm Climate, that they are unable to withstand the cold and variations of this Climate; for it is found, that they are constantly liable to take colds, and, in the generality of cases, shortly become Phthisical; whereas, if they are not sent out there, till they are 10 or 12 years old, the morbid tendency would probably be equally overcome with their advantage, that the vigour of body and strength.

But the cases of all others, in which removal to a warm Climate seems to be attended with the greatest benefit, are those in which no congenital pretious position exists, but who about the age of puberty become delicate and hectic-looking, having rufous white hair, and delicate circumcrescible colour in the cheeks; or who are very pallor, with hollow cheeks and eyes, usually with a dark mark under the two eyelids and much disposed to melancholy; these persons after taking cold are subject to a cough and

expectoration
Madeira

expectation of mucous, which after a time becomes habitual, the patient contracting the habit of strain-
ing himself into a cough, in order to discharge a small remaining quantity of mucous, which he conceives will continue to irritate as long as it re-
 mains in the Throat, but which is probably de-
leted in order to protect the parts from the patient's efforts; now if this is allowed to continue for any length of time, I have no doubt that what ori-
ginal cough is gradually superseded by a slight inflammation at the sign of the commences of the Bronchitis may ter-
minate in Otisitis pulmonalis, a change of scene, and the recreation of travelling in order to turn the mind from constantly dwelling upon the state of the lungs and health, is often all that is required to restore the body and mind to perfect health.

Persons afflicted with other disease of the chest as well as those of Digestion, Gout and Rheuma-
tism, occasionally go to Madeira for their health; but it is difficult to discover whether the benefit of any they obtain, is due to the climate or latterly to change of scene, and greater regularity of diet.
Madeira

I have now ended this subject: I had intended to have given some statistical Table with reference to the Diseases and Mortality of the Island, but I am sorry they have not yet arrived; it was also my intention to have described one or two cases of Elephantiasis and Quiliphey which I had the opportunity of seeing, but I fear that already my subject has tempted me beyond the usual limits of a Thesis; therefore I have to apologize for its length as well as its imperfections.

Edinburgh,
24 March
1844