

A great number of forest animals of all kinds.—It is understood that the Indians chose this region in preference for their abode, chiefly on account of the excellent hunting. Now-a-days the forests are for the most part cut down, and the animals have withdrawn to the interior and woodland regions. From the natives the Northmen bought squirrel-skins, sables, and all kinds of peltries, which are still to be found in abundance in this district.

Eyderducks and other *birds* were found in great numbers on the adjacent islands, as is also at present the case, on which account some of them have the name of Egg Islands.

Every river was full of *fish*, among which are mentioned excellent *salmon*. On the coast was also caught a great quantity of fish. The Northmen dug ditches along the shore, within the high-water mark, and when the tide receded, they found *halibuts* in the ditches. On the coast they also caught *whales*, and among these the *reidr* (*Balæna physalus*). In the modern descriptions of this region it is stated, that "all the rivers are full of fish," and of the waters in that neighbourhood it is said, "il y a une grande abondance de poissons de presque toutes les espèces." Salmon may be mentioned as one of these. Not long ago, the whale fishery was, in that very region, an important branch of industry, especially for the inhabitants of the adjacent islands. Very possibly the adjacent Whale Rock has its name from the same circumstance.

4. *Astronomical Evidence.*—Besides the nautical and geographical statements, one of the ancient writings has preserved an *astronomical* notice, where it is said, that the days there were of more equal length than in Iceland or Greenland: that on the shortest day the sun rose at half-past seven o'clock and set at half-past four, which makes the shortest day nine hours. This astronomical observation gives for the place latitude $41^{\circ} 24' 19''$. We thus see that this statement corresponds exactly with the other data, and indicates precisely the same region.

Discoveries of more Southern Regions.

The party sent by Thorwald Ericson in the year 1003 from Leifsbooths to explore the southern coasts, employed from four to five months in the expedition; they therefore most likely examined the coasts of Connecticut and New York, probably also those of New Jersey, Delaware, and Maryland. The description of this range of coast is accurate.

Are Marson's Sojourn in Great Ireland.

In those times the Esquimaux inhabited more southerly regions than they do now-a-days. This is both evident from the ancient accounts, and seems besides to gain corroboration from the skeletons of ancient times which have been dug up in regions even more southerly than those in question; a circumstance which however merits a more accurate examination. In the neighbourhood of Vineland, opposite the country inhabited by the Esquimaux, there dwelled, according to their reports, people who wore white dresses, and had poles borne before them on which were fastened lappets, and who shouted with a loud voice. This country was supposed to be Hvíttramannaland as it was called (the Land of the Whitemen), otherwise called I'rland It Mikla (Great Ireland), being

probably that part of the coast of North America which extends southwards from Chesapeake Bay, including North and South Carolina, Georgia, and Florida. Among the Shawanese Indians, who some years ago emigrated from Florida, and are now settled in Ohio, there is preserved a tradition which seems of importance here, viz., that Florida was once inhabited by white people who were in possession of iron implements. Judging from the ancient accounts, this must have been an Irish Christian people, who previous to the year 1000 were settled in this region. The powerful chieftain Are Marson, of Reykianes in Iceland, was in the year 983 driven thither by storms, and was there baptised. The first author of this account was his contemporary Rafn, surnamed the Limerick-trader, he having long resided at Limerick in Ireland. The illustrious Icelandic sage, Are Frode, the first compiler of the Landnama, who was himself a descendant in the fourth degree from Are Marson, states on this subject, that his uncle, Thorkell Gellerson (whose testimony he on another occasion declares to be worthy of all credit) had been informed by Icelanders, who had their information from Thorfinn Sigurdson Earl of Orkney, that Are had been recognised in Hvíttramannaland, and could not get away from thence, but was there held in high respect. This statement therefore shows, that in those times there was an occasional intercourse between the Western European countries (the Orkneys and Ireland) and this part of America.

Voyages of Biörn Asbrandson and Gudleif Gudlaugson.

It must have been in this same country that Biörn Asbrandson, surnamed Breidvíkingakappi, spent the latter part of his life. He had been adopted into the celebrated band of Jomsburgh warriors under Palnatoke, and took part with them in the battle of Fyrisval in Sweden. His illicit amatory connexion with Thurida of Frodo in Iceland, a sister of the powerful Snorre Gode, drew upon him the enmity and persecution of the latter, in consequence of which he found himself obliged to quit the country for ever; and in the year 999 he set sail from Hraunhöfn in Sniofelanes with a N.E. wind. Gudleif Gudlaugson, brother of Thorfinn, the ancestor of the celebrated historian Snorre Sturluson, had made a trading voyage to Dublin; but when he left that place again, with the intention of sailing round Ireland and returning to Iceland, he met with long continuing north-easterly winds, which drove him far to the south-west in the ocean, and at an advanced period of the summer he and his company arrived at last at an extensive country, but they knew not what country it was. On their landing, a crowd of the natives, several hundreds in number, came against them, and laid hands on them, and bound them. They did not know anybody in the crowd, but it seemed to them that their language resembled Irish. The natives now took counsel whether they should kill the strangers, or make slaves of them. While they were deliberating, a large company approached, displaying a banner, close to which rode a man of distinguished appearance, who was far advanced in years, and had gray hair. The matter under deliberation was referred to his decision. He was the aforesaid Biörn Asbrandson. He caused Gudleif to be brought before him, and addressing him in the Norse language, he asked him whence he came. On his replying that he was an Icelander, Biörn made many inquiries about his

acquaintance in Iceland, particularly about his beloved Thurida of Frodo, and about her son Kiartan, supposed to be his own son, and who at that time was the proprietor of the estate of Frodo. In the mean time, the natives becoming impatient and demanding a decision, Biörn selected twelve of his company as counsellors, and took them aside with him, and some time afterward he went towards Gudleif and his companions, and told them that the natives had left the matter to his decision. He thereupon gave them their liberty, and advised them, although the summer was already far advanced, to depart immediately, because the natives were not to be depended on, and were difficult to deal with, and moreover conceived that an infringement on their laws had been committed to their disadvantage. He gave them a gold ring for Thurida, and a sword for Kiartan, and told them to charge his friends and relations not to come over to him, as he was now become old, and might daily expect that old age would get the better of him; that the country was large, having but few harbours, and that strangers must everywhere expect a hostile reception. They accordingly set sail again, and found their way back to Dublin, where they spent the winter; but next summer they repaired to Iceland and delivered the presents; and everybody was convinced that it was really Biörn Asbrandson whom they had met with in that country.

Bishop Eric's Voyage to Vineland.

It may be considered as certain that the intercourse between Vineland and Greenland was maintained for a considerable period after this, although the scanty notices about Greenland contained in the ancient MSS. do not furnish us with any satisfactory information on this head. It is, however, recorded that the Greenland Bishop Eric, impelled probably by a christian zeal either of converting the colonists or of animating them to perseverance in the faith, went over to Vineland in the year 1121. As we have no information of the result of his voyage, but can merely gather from the above expression that he reached his destination, we must presume that he fixed his permanent residence in Vineland. His voyage, however, goes to corroborate the supposition of a lengthened intercourse having been kept up between the countries.

Discoveries in the Arctic Regions of America.

The next event in chronological order, of which accounts have been preserved in ancient records, is a voyage of discovery in the Arctic regions of America, performed during the year 1266 under the auspices of some clergymen of the bishopric of Gardar in Greenland. The account of it is taken from a letter, addressed by a clergyman of the name of Halldor, to another clergyman named Arnold, formerly established in Greenland, but who had then become chaplain to the Norwegian King Magnus Lagabæter. At that time all men of any consequence in Greenland possessed large vessels built for the purpose of being despatched northwards in the prosecution of hunting and fishing expeditions. The northern regions which they visited were called Nordrsetur; the chief stations were Greipar and Króksfiadarheidi. The first of these stations is supposed to have been situate immediately to the southward of Disco; but that the ancient Northmen went much farther north

on this coast may be inferred from a very remarkable runic stone, found in the year 1824 on the island of Kingiktórsoak, lying in the latitude of $72^{\circ} 55' N$. The latter mentioned station was to the north of the former. The object of the voyage is stated to have been, to explore regions lying more to the northward than those they had hitherto been accustomed to visit, consequently lying farther north than Króksfiardarheidi, where they had their summer quarters (*setur*), and which they were therefore regularly accustomed to visit. Relating to this voyage of discovery the following particulars are mentioned:—

They sailed out of Króksfiardarheidi, and after that encountered southerly winds, accompanied by thick weather, which obliged them to let the ship go before the wind. On the weather clearing up, they saw many islands and all kinds of prey, both seals and whales and a great many bears. They penetrated into the innermost part of the gulf, and had icebergs (glaciers) lying also to the southward as far as the eye could reach. They observed some vestiges indicating that the Skrellings had in former times inhabited these regions, but they could not land on account of the bears. They then put about and sailed back during three days, and now again they found traces of the Skrellings having been on some islands lying to the southward of a mountain by them called Sniofell. After this—on St. James's day—they proceeded southwards, a great day's rowing. It froze during the night in those regions, but the sun was above the horizon both night and day, and when on the meridian, in the south, it was not higher than that when a man lay down across a six-oared boat, stretched out towards the gunwale, the shadow formed by the side of the boat nearest the sun reached his face: but at midnight the sun was as high as when it was (highest) in the north-west in the Greenland colony. Afterwards they sailed back again to their home at Gardar. Króksfiardarheidi, as we have observed above, had been for some time previous regularly visited by the Greenlanders. The name shows that the firth was surrounded by barren highlands (*heidi*), and the description of the voyage shows that it was a firth of considerable extent, in and through which there was room for several days' sail. It is stated, for instance, that they sailed out of this firth or sound into another sea, and into the innermost part of a gulf, and that their returning voyage occupied several days. As to the two observations mentioned as having been taken on St. James's day, the first of them leads to no certain result, as we have no sure means of ascertaining the depth of the boat, or rather the relative depth of the man's position, as he lay across the boat, in reference to the height of the side of the same, so as to enable us to deduce the angle formed by the upper edge of the boat's side and the man's face, which is the angle measuring the sun's altitude at noon on St. James's day, or 25th July. If we assume, as we may do with probability, that it was somewhat less than 33° , and yet very near that measure, the place must have been situate near N. L. 75° . There seems no probability that it was a larger angle, and consequently that the place lay more to the southward. The result obtained from the other observation is however more satisfactory. In the thirteenth century, on the 25th July, the sun's declination was $+17^{\circ} 54'$; inclination of the ecliptic $+23^{\circ} 32'$. If we now assume that the colony, and particularly the episcopal seat of Gardar, was situate on the

north side of Igaliko Firth, where the ruins of a large church and of many other buildings indicate the site of a principal settlement of the ancient colony, consequently, in $60^{\circ} 55' N. L.$, then at the summer solstice the height of the sun there, when in the north-west, was $= 3^{\circ} 40'$, equivalent to the midnight altitude of the sun on St. James's day in the parallel of $75^{\circ} 46'$, which falls a little to the north of Barrow's Strait, being in the latitude of Wellington's Channel, or close to the northward of the same. The voyage of discovery undertaken by the Greenland clergymen was therefore carried to regions, which in our days have been more accurately explored, and their geographical position determined by Sir Edward Parry, Sir John Ross, and Captain James Clark Ross, and other British navigators, in the no less daring and dangerous expeditions conducted by them.

Newfoundland re-discovered from Iceland.

The discovery next recorded was made by the Iceland clergymen Adalbrand and Thorwald Helgason, well known in the history of Iceland as having been involved in the disputes at that time prevailing between the Norwegian King Eric Priesthater and the clergy, and which in Iceland were chiefly headed by the governor, Rafn Oddson, and Arne Thorlakson, Bishop of Skalholt. Accounts drawn up by contemporaries contain merely the brief notice that in the year 1285 the above mentioned clergymen discovered a new land to the westward of Iceland (*fundu nýja land*). This land, to which by command of King Eric Priesthater, a voyage was some years afterwards projected by Landa-Rolf, is supposed to have been *Newfoundland*.

A Voyage to Markland in the Year 1347.

The last piece of information respecting America, which our ancient MSS. have preserved, refers to a voyage in the year 1347, from Greenland to Markland, performed in a vessel having a crew of seventeen men, being probably undertaken for the purpose of bringing home building timber and other supplies from that country. On the voyage homeward from Markland the ship was driven out of her course by storms, and arrived with loss of anchors at Straumfiord in the west of Iceland. From the accounts, scanty as they are, of this voyage, written by a contemporary nine years after the event, it would appear that the intercourse between Greenland and America Proper had been kept up to so late a date as the year above mentioned; for it is expressly said that the ship went to Markland, which is thus named as a country that in those days was still known and visited.

* * * * *

After having perused the authentic documents themselves, which are now accessible to all, every one will acknowledge the truth of the historical fact, that during the tenth and eleventh centuries, the ancient Northmen discovered and visited a great extent of the eastern coasts of North America; and will besides be led to the conviction, that during the centuries immediately following, the intercourse was never entirely discontinued. The main fact is certain and indisputable. On the other hand there are, in these as in all other ancient writings, certain portions of the narrative which are obscure, and which subsequent disquisitions

and new interpretations may serve to clear up. On this account it seems of importance that the original sources of information should be published in the ancient language, so that every one may have it in his power to consult them, and to form his own judgment as to the accuracy of the interpretations given.

With regard to such traces of the residence and settlement of the ancient Northmen as, it is presumed, are still to be met with in Massachusetts and Rhode Island—the countries which formed the destination of their earliest American expeditions—we will content ourselves for the present with referring to the hints, which are contained in the work itself. This matter will continue to form a subject for the accurate investigation of the Committee of the Royal Society of Northern Antiquaries on the Ante-Columbian History of America; and the result of this investigation, together with such additional elucidations of the ancient MSS. as we may have it in our power to furnish, shall be communicated in the Annals and Memoirs of the Society.

VIII.—*Sketch of the Island and Gulf of Symi, on the South-western Coast of Anatolia, in February, 1837.* By James Brooke, Esq.

[The island of Symi* lies about 18 miles N.W. of the northern point of Rhodes, at the mouth of a gulf of the same name—the ancient *Sinus Doridis*. The island is mentioned, in modern times, by Hasselquist in 1750; by Van Egmont and Heyman in 1700; and by Dr. Clarke in 1801. But of the Gulf of Symi nothing accurate is known; its outline, as well as that of the Gulf of Cos, from which it is separated only by the peninsula formerly called *Triopium*, is most incorrectly marked on our charts:—this part of the coast lies between the western termination of Captain Beaufort's survey of Karamania, which only came as far as the Gulf of Makri, and the survey of the coast of Asia Minor, now executing by Lieutenant Graves, R.N.—but as it is probable that officer may not be enabled to reach these gulfs before the close of the year, we are glad to profit by the information afforded by Mr. Brooke, who visited Symi in his yacht during the spring of the past year.]

ON the authority of Pliny, V. 28, the *Sinus Doridis* was included between the *Triopium Promontory* and that of *Cynos-sema*, and this space, with which the ancients were well acquainted, is scarcely known to modern geography. Even the Island of Symi, lying directly in the track of vessels bound along the coast, is so imperfectly described, that the following brief account may possess some degree of interest as relating to the least-visited portion of the shores of Asia Minor, until a more complete description be obtained.

After visiting various places between Smyrna and Rhodes, we reached the harbour of Panerimiotis,† at the south-western point of Symi, early in the morning of February 2, 1837.

* Syma or Syme, 'Ε Σύμα, Meletius, Geograph. Ant. et Nov. Ven. ii. 222.

† Perhaps ἡ πανερμιώτισσα, "the most solitary."

Symi is a high rocky and barren island of grey limestone, rising about 1000 feet above the sea, its general outline irregular, and its coasts bold and steep. Deep indentations mark both the northern and southern extremities of the island. The soil is extremely unproductive, but the inhabitants cultivate every available patch of ground between the rocks with great assiduity. Commerce and enterprise have rendered this unpromising spot a thriving mart. It is a *dépôt* for sponge and wood. The former article is found in the neighbouring seas, and employs the male population during the summer to procure it. France is the great outlet for the coarser, and England for the finer kind of this article, but some of it is carried direct to its destination. Greek boats come from Rhodes, Greece, Smyrna, &c., to convey the sponge previous to its shipment in European vessels. This intermediate carrying trade is useful and lucrative to the boatmen of Symi in particular, and generally to those of the whole coast and islands. The second export, wood, is collected in the Gulf of Symi, and along the coast to the eastward towards Makri and Marmorice,* and exported from the island even as far as Alexandria, whence ships come for their cargoes. The possession of three harbours affords Symi these resources, and it is pleasing to observe the active use they make of these natural advantages. The island is included in the *Páshalik* of Rhodes, and their annual tax amounts to 27,000 piastres, about 270*l.*,—a very light burden divided among a population of not less than 7,000 persons.

At the southern extremity of Symi is the island of Kiskilies, a picturesque and fertile spot, about a mile or more in extent. Off the Kiskilies (so called in the charts) on the S. E. side is a detached cluster of rocks and an islet near them. To the westward is likewise an islet, with a narrow but deep passage between it and the larger island. A passage of a mile or more divides Kiskilies from Symi; it is deep and clear from danger, but the wind is not to be trusted, on account of the high land. At the S. W. angle of the island of Symi is the harbour of Panerimiotis:—a deep bay incloses the mouth of the port, which is narrow and formed by natural piers. It faces N. W. In coming from the southward, after rounding Kiskilies,† the outer bay will easily be discerned from its depth, and the right shore may be kept on board until the harbour's mouth opens. The best leading marks into the port, however, are four islands which run out from the westernmost point of Symi. From the outer one of these islands the compass course E. by S. will conduct to the harbour's mouth. The headland on the left hand going in, which forms the western

* *Mermerichah*, from the Slavonian and Greek *Marmaritz*a, a diminutive of *Marmara*.

† Probably from the Latin *Quisquillæ*, "chips."

extremity of the bay, is bold and projecting, but a rock or shoal is reported to lie off it; and it will, therefore, be advisable to give it a berth on coming from the northward and westward. The harbour's mouth is about two hundred yards wide and deep, within a short distance of either shore. The soundings just within the entrance are six fathoms, then five, four, and three. The harbour has three, and a quarter less three fathoms all over it—is oval in shape, and secure from all winds, but the holding ground is not very good. Its breadth is about half a mile, and it forms a convenient shelter for small vessels. At the bottom of the bay is the monastery of Panerimiotis, inhabited by a few Greek monks: they were very civil and obliging, and furnished us with a bullock, some poultry, and vegetables, but, generally speaking, wood, water, and provisions must be brought from the capital in boats, as the Caloyers are the only inhabitants, and the road to the town is over steep and rugged mountains.

Symi, the capital and only town on the island, is a thriving place, situated on an acclivity above the Scala* or landing-place in the bottom of the bay at the north-eastern angle of the island, and facing the Gulf of Symi, which from the centre of the bay bears E.N.E. The sailing directions for the Archipelago place this harbour at the wrong end and wrong side of the island, evidently confounding the Scala of Symi with the port of Panerimiotis.

The harbour is long and narrow, with deep water, and vessels lie close in with their warps made fast to the shore. To make the port from the northward, round the headland with a small islet off it, and steer S.W. $\frac{1}{2}$ S. (by compass) for the anchorage. Approaching from the southward, round the Windmill Hill, which forms the south-eastern point of the bay, and keeping the southern shore on board, steer directly for the Scala. On coming from the southward, however, the town of Symi will be seen on the hill at the head of a deep bight, before rounding Windmill Hill, but this bight must not be mistaken for the harbour.

Here is a castle with remains of Cyclopean walls, and on the Windmill Hill is a circular Hellenic building, said to be the trophy erected by the Lacedemonians on their defeating the Athenian squadron. These, with fragments of other walls and terraces, are sufficient perhaps to identify the present with the site of the ancient town.

The harbour called Nimborio by the natives, *alias* Emporio, is to the northward of the Scala, and divided from it by a rocky

* Scala, a staircase or ladder, has since the time of the Genoese and Venetian predominance in the Archipelago, been the common term for a harbour throughout the Levant; the Turks have converted it into Iskeleh, and the French into Echelle.—F. S.

ridge; it is situated at the bottom of a bay, but as we did not visit it, I can say nothing beyond pointing out its situation.

My impression of the island of Symi is altogether favourable. Nothing can exceed the barrenness and sterility of its limestone mountains, but its harbours afford a source of wealth which supplies the defects of its soil. Every thing bespeaks commercial vigour and prosperity. Provisions of all descriptions can be obtained—we even procured *rum and potatoes*, articles unknown at Rhodes.

The population of Symi may be about 1000 persons. The women are diminutive and plain; their costume is a long, loose quilted jacket, and a scanty red petticoat; a huge turban composed of manifold handkerchiefs surmounts the head, and their legs are adorned with large boots. From the neck to the waist they wear a line of round silver ornaments, and appear fond of decking themselves with trinkets. Of the men it is difficult to judge, since natives and foreigners are confounded; as agents and merchants from various sea-ports live here to purchase sponge, and together with Greek skippers and pilots, form a miscellaneous race.

After a stay of a few days in the island our party started on a boat excursion for the Gulf of Symi. Passing between Symi and the Kiskilies we stretched across to the main-land, where, the wind dying away, we took to our oars and pulled gently along. If Symi be little known, what can I say of the main-land? The charts are an absolute dead letter, not giving the faintest resemblance to the coast. There are *two* headlands where the charts lay down Cape Volpo;* one stretches to the southward, and the other approaches the island of Symi. From the latter of these points (probably the Cape Volpo of the charts) the coast forms a capacious bay, *before* reaching the larger gulf. Two other headlands, nearly on the same meridian as the former, lie between the above-mentioned bay and the Gulf (so called) of Symi. Off the southernmost of these is a dangerous patch of rocks, which was barely above water when we saw it. The bearing of the N. point of Symi from the shoal is W. by N. The nearest headland towards the Gulf of Symi N.E. The east point of Kiskilies S.S.W. Distance from the shore from half to three quarters of a mile.

Rounding the two headlands already mentioned, the Gulf is open. Five islands lie on the right or southern shore; the three first small, the two last much larger. The larger islands are so shut in with the main as apparently to form a separate bay. Within these islands the main-land is bold and indented. Passing

* Cynos-sema (Dog's Tomb) of the ancients, called Alepú (Fox) by the modern Greeks. Volpo is the vulgar word for Volpe.—F. S.

a deep bight opposite the fourth island, we pulled along under a bold and precipitous cliff. The scenery was grand and imposing, and the various openings and curves of the bay before us kept our attention on the stretch. There are patches of cultivation on the larger islands; an islet lies between the fifth island and main. At the termination of the cliff a large bay opens, affording a most attractive view. On the further shore of this bay are the ruins of a city and castle crowning the summit of a hill, from 800 to 1000 feet high. Considerable remains of Cyclopean walls exist amid the later works of the Byzantine period, and traces of tombs and foundations are numerous in the valley below. The situation is steep and difficult of access. The castle, from its extent, must have been a place of importance, and the ancient city by no means insignificant. Leaving this bay we proceeded into the bight, where, about one mile and a half from the beach, the village of Bidelos, containing about 200 persons, is situated, and through which flows a small stream. A short distance further the shore recedes and forms another deep and varied bay; on one side is a rocky island. There are ancient remains all along the shore of this bay, and on the neighbouring hills. They consist entirely of terraces and portions of wall chiefly Cyclopean, but too numerous and too much scattered to admit the belief that they all belonged to one city. From the nature of the materials, there is little hope of finding inscriptions: one, however, I discovered in the ruins of a Greek church. The scenery here is of the finest and most picturesque nature: the valley lies enclosed by an amphitheatre of pine-clad and craggy mountains, through which a stream winds its course, and discharges itself into an inner basin formed by a neck of sand. There is another village, of about forty houses, situated rather more than a mile up the stream. In this bay we passed our second night, in a situation as cool and as picturesque as the former—our huge fire burned clearly against a few blocks of an ancient wall, and the remains of a more recent building partly protected us from the night air. At the further extremity of the Gulf is another castle, and probably an ancient city: we did not land, for our time was limited. Glancing therefore at the extremity of the Gulf, we crossed to the northern shore and sailed along it. It is barren, red, and not so deeply indented, forming from its colour a strong contrast with the opposite coast.

The narrowest part of the Gulf is nearly abreast of the fifth island, perhaps about two miles, and its depth may be roughly estimated from twelve to fourteen miles.

We did not follow the shore further than a spot which we called Gothic Isle; but could perceive many bays and curves towards the entrance of the Gulf. From Gothic Isle the land trends away towards the isthmus which forms the Triopium promontory. This neck of land between the Gulfs of Cos and Symi is narrow

throughout its whole extent; but though we had no opportunity of landing to ascertain the exact point where the Cnidians proposed dividing their promontory from the main, I feel no hesitation in saying that the spot is, where the land sinks into a bay, bearing N. by W. from Symi. This bay is deeper than generally represented; the coast comparatively low, and the water of the Gulf of Cos visible from Symi and other places. It appears very narrow, but whether exactly five stadia across, I am unable to say, and it would, perhaps, be best to leave the naming of the various features to those who are better acquainted with the ancient geography of the Gulf. I will, however, venture to glance at the ancient account of the Sinus Doridis. The limits of the Gulf may be fixed between the Triopium Promontorium* and the headland called Cynos-sema. Within the Gulf were the three subordinate bays of Bybassus,† Schænus, and Thymnias.‡ The Triopium Peninsula met the Bubassian or Bybassian Peninsula, and at the junction was the proposed cut of the Cnidians. Nothing can agree better with our observations. A deep bay is formed at the junction of the two Peninsulas, which it is just to suppose is the Bubassius Sinus. The city of Acanthus was in this bay,§ and a Greek of Symi informed us of some ruins situated in the bight on the Triopium Peninsula. I regret we did not examine this more minutely, but the deep bay and the narrow isthmus joining the two Peninsulas is beyond doubt. The bay we did examine (called the Gulf of Symi) may be either Thymnias or Schænus; on Cramer's authority I call it the latter. Several towns were situated within it. It may be observed that Colonel Leake places Asseréna at the extremity of the bay near the shore; Cramer omits this town,|| but remains do exist in the place marked by Colonel Leake. Hyda was likewise within this bay, and the ruins of the city on the hill being considerable may be referred to that place. There are likewise other remains which might justly have been looked for.

If this slight sketch of the topography of this Gulf be correct, and it appears probable, the Aphrodisian Promontory will be found distinctly marked between the two bays.¶ The Sinus Thymnias (entirely omitted in modern charts) will likewise be evident, and Cape Volpo will be the Cynos-sema Promontorium.

I will here conclude these remarks of a hasty visit to a most interesting locality, which added, and still adds, the charm of novelty to the higher interests of antiquity and natural beauty.

* Now Cape Krio.

† *Βύβασσος*.

‡ Cramer, *Asia Minor*, ii, 189. § In the Peninsula of Cnidus (Steph. Byz.).

|| Because it is modern, not ancient.—F. S.

¶ "Three bays in succession," says Mele (i. 16), "Thymnias, Schænus, Bubassius. Aphrodisium is the Promontory of Thymnias; Schænus surrounds Hyda, Bubassius (i. e. Bubassian bay), Acanthus." He is travelling from S.E. to N.W. Dr. Cramer has overlooked the order of these bays.—F. S.

IX.—*On the difference of level between the Black Sea and the Caspian.* Communicated by the Baron ALEXANDER VON HUMBOLDT.

THE kindness of M. Kupffer, Corresponding Member of the Society at St. Petersburg, enabled us to give, at p. 426, Vol. vi. of the Geographical Journal, some account of the Russian expedition about to be sent forth, in 1836, to determine the long-contested point of the difference of level between the Black and the Caspian Seas. That expedition has fulfilled its object.

The trigonometric levelling along the line of country between Novo-Tcherkask, by Stavropol, to Kisliar, is now completed, and although the detail of the survey has not yet reached London, yet the fact of the determination of so remarkable a point in physical geography is too important not to find a place in the Geographical Journal, especially as the Society is indebted for the communication of it to one of its most distinguished Foreign Members.

“ *Berlin, Jan. 10, 1838.*

“ The beautiful trigonometric levelling between the Black and the Caspian Seas is at length finished. There is a depression, but a much less depression than M. Parrot had announced after his first barometric levelling by stations; this always appeared to me probable (see my letter to M. Parrot, inserted in his ‘*Voyage à l’Ararat*,’ vol. ii. p. 192), on account of the elevation of Kasan (level of the junction of the Kasanza and the Wolga), and on account of some corresponding observations which I obtained during my journey to the Caspian. The levelling of MM. Fuss, Sabler, and Sawitch, shews that the level of the Caspian is 101.2 Russian feet, equal to 94.9 Paris feet (old measure), lower than the level of the Black Sea.

“ The height of Kasan has been much discussed, and all travellers have assumed different heights; at page 639 of the volume published by M. Gustave Rose, I have given the latest results of the labours of the astronomer Simonoff, professor at Kasan. The cistern of the barometer in the building of the University (Universitäts Gebäude) at Kasan, has an elevation of 181 Paris feet; the junction of the Kasanza and the Wolga is 53 feet (8.9 toises) above the level of the ocean. The fall of the Wolga from Kasan to the Caspian would be then 148 feet, or 24.7 toises. In a direct line it is about 157 geographical leagues (of 15 to the degree) from Kasan to the Caspian. This is a greater inclination than that of the Amazon or the Nile, and almost as great as that of the Oder. The most striking fact is the little elevation of part of the interior of the East of Europe above the level of the ocean, since from Kasan to the Icy Sea it is 135

geographical leagues. The city of Berlin, so near the Baltic, is 100 feet above the level of the sea, according to an excellent trigonometric levelling, which the chief of the staff corps has, at my request, caused to be executed during last year, by the able observer M. Bayer.

"I cannot sufficiently congratulate the Geographical Society on having found so excellent a traveller as M. Schomburgk: his latest labours, the ascent of the Rivers Corentyn and Berbice, in Guayana, place him very high in my opinion; and the zone of hieroglyphic figures, sculptured in the rocks from Encamarada, in $66^{\circ} 50'$ W. longitude, as far as the eastern limit of British Guayana, a distance of nearly 600 miles, is an ethnographical phenomenon which daily increases in interest.

"The astronomical geography of the North of Asia will shortly be set right by the publication of the important labours of M. Federow, *élève* of M. Struve, who has recently returned, after a five years' absence. Should I still publish the detail of my astronomical observations in Siberia, it will only be in order to fix more accurately the points where I have made observations on terrestrial magnetism.

"I learn with the greatest satisfaction that my letter to the Duke of Sussex, on the subject of Magnetic Observatories, has produced some useful results. As we make observations here both with the needle of Gambey, furnished with microscopes and with the new apparatus of Gauss, an apparatus furnished with a mirror, we have an opportunity of convincing ourselves more and more of the great perfection of this mirror apparatus, which doubtless requires greater skill and more instruction on the part of the observers; the tracing of the curves of horary variation, based upon observations made across all Europe for every five minutes of time (see Gauss und Weber, *Resultate aus den Beobachtungen des Magnetischen Vereins im Jahr 1836*; Göttingen, bei Dietrich, 1837), will prove what advantage is derived from making use of the apparatus of Gauss, which doubtless will soon be employed in all our great observatories.

"As I think that this subject is not without importance to Seamen, I beg you to invite the leading Members of the Geographical Society to be good enough to propagate Gauss' manner of observing in all new stations, where intelligent persons can be found. Points near the Magnetic Equator, and those which are in high latitudes in the southern hemisphere, as the Cape of Good Hope, Australia, Van Diemen's Land, would be the most desirable, if they would observe at the same epochs indicated by M. Gauss, and followed throughout the North of Asia, in Germany, in Sweden, and at Milan."

X.—*Notes of a Journey in Asia Minor, in 1837.* By W. J. HAMILTON, Esq. Read 26th March, 1838.

A SHORT account of my journey in Asia Minor, in 1836, extracted from private letters, having been read before the Royal Geographical Society, I beg leave to submit for the same purpose the following sketch of that which I made through the more southern portion of that country in 1837.

I left Constantinople on the 24th of May, and again crossing the Propontis, landed at Modányah; from thence I proceeded in a S.S.W. direction to Abulliont, situated on a small island near the north-eastern extremity of the lake of the same name, and connected with a narrow peninsula by a long wooden bridge. I copied a few inscriptions in the ruined walls of the town, ascertained the position of the theatre, and observed the foundations of several small buildings outside the town, which were probably the tombs. Although no inscriptions mention its name, there can be no doubt that the modern town of Abulliont stands upon the site of Apollonia ad Rhyndacum. On one of the small islands near it are the remains of considerable massive walls of Hellenic construction. From hence I proceeded four hours along the northern shore of the lake to U'lúbád, where are the ruins of a large Byzantine fortress, and where the Rhyndacus, which I crossed by a long wooden bridge, flows out of the lake. Two hours more, nearly W. by N., over low marshy ground, brought me to Mikhálich,* a large and straggling town of 1500 houses picturesquely situated on some low hills near the junction of the Rhyndacus and the Macestus.

May 26th.—Mikhálich to Aïdinjik,† ten hours in a westerly direction, over an uninteresting undulating country. Three hours before we reached Aïdinjik I came in sight of the lake of Miletopolis, now called Mániyás Gól,‡ situated in a low flat grassy country to the south: near Aïdinjik the scenery improves, and the ground is highly cultivated. The town is full of ancient fragments brought from the ruins of Cyzicus, called Balkís § by the Turks, and the

* Commonly pronounced Múhálch.—A. For all the notes not marked A. the Foreign Secretary is responsible. The orthography of the names of places is according to the standard adopted by the Society.—See vol. vii., p. 245.

† Little Moonshine. Jihán-numá, p. 669.

‡ Mániyás gól (pronounced ghieul, according to the French orthography), not mentioned in the Jihán-numá (Speculum Mundi), p. 656.

§ Balkís-seráï. It is known, says Kátib Chelebi Hájt Khálífah (Jihán-numá, p. 669) by the name of Tamáshálik (Showplace, because Suleimán Páshá there shewed the shores of Europe to O'rkhán, and urged him to cross over and conquer them) and Balkís Seráýt, i. e. "The Palace of Balkís," the queen of Sheba.

Colonel Leake observes that *Bal* is often used in the names of places to signify *old*, being, perhaps, a corruption from *παλαιός*. Kis is evidently the first syllable of *Cyzicus*, pronounced as in Greek with a *K*; Balkís would therefore mean Old Cyzicus.—A.

Aghá showed me several sepulchral monuments or votive tablets with inscriptions, all from the same place, which he was anxious I should purchase, but they were not sufficiently interesting to tempt me.

May 27th.—Visited Artákí* and Cyzicus. At the former place the plague was raging violently, so that I did not stop there long. I visited the harbour, where are the remains of an ancient mole, and returned to the ruins of Cyzicus, visiting Cape Mélanos in the way. The ruins on the Cape do not appear to be of very great antiquity, and are certainly neither Hellenic nor Cyclopean. At Balkís I pitched my tent under the walls of the town, near a beautiful fountain under some fine plane trees, and near what was probably the western harbour, but which, being choked up with sand, is now a mere swamp. The whole site of Cyzicus is so covered with gardens, or overgrown with underwood and a luxuriant vegetation, that it is extremely difficult to make out anything distinctly. I discovered the remains of a very large theatre, nearly overgrown with ilex and other shrubs, besides the amphitheatre or naumachia mentioned by former travellers, and several other large buildings, but from their ruined state it is impossible even to guess at their original destination. On the whole, considering the great renown of the architects of Cyzicus, I was much disappointed at the poor and meagre style of all its buildings, which do not at all bear the solid and imposing character of Hellenic masonry. No doubt there is much buried under the soil, the constant accumulation of which is greater here than usual, in consequence of the nature of the rock on which the town was built, which is a soft and rapidly decomposing granite, which, from the quantity of feldspar contained in it, and the smallness of its grains of quartz, produces a fine rich soil, and with it a luxuriant vegetation. To the eastward of the town, and partly on the narrow isthmus, the large and closed harbour may be traced, as well as a narrow passage or canal of solid masonry, by which it communicated with the sea, and which was probably the part which, as we learn from Strabo, could be closed. The whole country between Balkís and Artákí is covered with flourishing vineyards, and the wine of Artákí is much esteemed, even at Constantinople.

May 28th.—After again exploring the ruins, and waiting until I could obtain a meridional observation, which places Cyzicus in latitude 40° 23' N., I returned to Aïdinjik, and on the following day started for the purpose of tracing, if possible, the course of

* Έχει πηγήν, says Meletius (Geogr. iii. p. 130) ἡ δὲ πηγή τοσάλαι καλεῖται τοῦ Ἑρωτος, καὶ ἵσται πηγή περὶ αὐτὴν εἶναι, Ἀρτακία λεγομένη. "It has a spring which was anciently called the 'Fountain of Love;' and there is another spring near it, called 'Artakia,' named perhaps from Ariákí ('Αρτάκη, p. 131), formerly a city, now a country town (κομμόπολις), near to which runs the river Priapus." This is the ἕρως ὑπὸνδρος Ἀρτάκη of Strabo, xii. p. 576.

the *Sûşighirî-sû** or Macestus, which, as I learnt at *Aïdinjik*, takes its rise in a large lake near *Símáwul*.†

Three hours from *Aïdinjik*, while travelling round the western end of the lake of *Miletopolis*, I passed through an interesting settlement of *Cossacks*,‡ who have been there ever since the capture of *Isma'îl*, in 1770,§ and preferring Turkish to Russian rule, have been protected and encouraged by the Turks. They live principally on fish, which they catch in great quantities in the lake, and the neighbouring hills and low plains afford excellent pasture for their flocks: they pay no taxes to the Turkish government, choose their own chief, and have a small church. Their fair Teutonic looking features contrasted strongly with the dark complexion of the Turks, and the long embroidered white smock-frock of the peasants first called my attention to the peculiarity of their appearance. The plague had lately broken out among them, and as we left the village, our road led us through an enclosed space, in which the sick were placed in small huts made of rushes; their relations brought them provisions, leaving them on the ground near the hut, and carefully avoiding all contact. In the evening we reached, after crossing several streams flowing into the lake from the wooded hills to the south, the small village of *Meulvíkôî*|| eight hours from *Aïdinjik*.

May 30th.—An hour's ride E.S.E. brought me to the village of *Mányás*,¶ which lies a little way off the high-road towards the south. Here I found abundant traces of an ancient site, and several inscriptions, some of which are built into the walls of a Byzantine fortress, which now occupies the hill, once the Acropolis of the ancient town. Part of this wall is entirely composed of ancient blocks and pedestals, altars, &c. Whole courses in some of the towers consist of columns laid transversely across the wall, whilst others are formed of pedestals, some of which probably have inscriptions. I am inclined to think that these ruins mark the site not of *Miletopolis*, but of *Pœmanenus*,** which was

* Properly *Sûşighirî-sûî*, i. e. Buffalo-water. *Sûşighir* or *sûşighir*, water-ox is the Turkish word for buffalo.

† *Símál* or *Símán* is mentioned in the *Jihán-numá* (p. 632) as one of the districts of *Kermiyan* (Phrygia Epictetus). In the text it is spelt *Símáú*; in the map *Símán* or *Símál*; w, n, and l, when carelessly formed, nearly resemble each other in the Arabic character. *Símáú* might be a corruption of *Synnae*, as the modern Greeks would pronounce *Synnaus*.

‡ *Kázákî*; nine miles from *Aïdinjik*.

§ Hammer, *Gesch. des Osmanischen Reichs* viii. 363.

|| *Mevlevî-kôî*, five hours from the *Kázákîs*, twenty-four miles from *Aïdinjik*. *Kôî* is pronounced as *Kiewi* in the French orthography.

¶ *Mányás*, J. n. p. 656, three miles from *Mevlevî-kôî*, twenty-seven from *Aïdinjik*.

** *Pœmanénium* is the termination given by *Stephanus Byzantinus*; the vowels are ascertained by the coin (*Sestini Lett. Num. iv. 76*). *Phemenio* is the ablative of *Pœmenion*, a corrupt contraction of *Pœmanœnum* introduced in the times of the Lower Empire. (*Cramer's Asia Minor*, i. 56-58.)

afterwards called Phemenio. This name, leaving out the first syllable, greatly resembles the modern name, which, combined with the remarkable position of the Acropolis, so completely answering to that of *πολίχιον ἐρυμνότατον*, as described by Anna Comnena (p. 440), leaves in my opinion no doubt upon the subject. From thence I proceeded four hours S.S.E. to Şú-sighir-lí, descending into the valley through which the Macestus flows, by some fine wooded hills. Soon after leaving Şú-sighir-lí, we reached the banks of the river, and proceeded several miles up it, through very beautiful woodland scenery, to a place called *Qayá Kapú*, or *Tash-kapú*, Rock-gate,* or pass of the rock, where the road winds along a narrow path cut on the steep side of the rock overhanging the deep torrent below. A ruined castle on the height above defends the pass, which, from the remains of a massive bridge over the river, appears to have been once of considerable importance. The rich meadows and valleys which we crossed, leaving the river on the left, were covered in many places with the white Iris in full flower. About three hours from Şú-sighir-lí I reached the small village of Ildiz,† where I halted for the night.

June 1.—Ildiz to Kefsút‡ or Kespít, four hours S. by W. Leaving the Macestus winding through a broken hilly country to the left, our road led us across a range of high and partly wooded hills by a steep and winding path. Before reaching Kepsúd, I crossed the Şú-sighir-lí Şú again, which flows from W. by S. to E. by N., and is joined immediately above the town by another river from the S.E., the sources of which are said to be at a place called Bólát,§ twelve hours off, nearly S.E. At Kepsúd, which is in latitude 39° 39' 0" N., I found a great number of inscriptions and other remains of antiquity scattered about the town; but none of the inscriptions throw any light upon the ancient name of the place, nor could I learn from the natives whence they had been brought; but its situation, in a rich plain at the confluence of two streams, renders it not unlikely that it is the site of some ancient town. Here I was again told that the main branch of the river rose near Símáwul, and was better known by the name of Símáwul Şú. From Kefsút [Kepsúd] I ascended the valley of the Macestus through a hilly country, for seven hours, nearly S., with the river on my right as far as Bigaditza,|| situated

* I believe this to be the Demir Kapou in Wheler's Narrative.

† Or Yildiz, i. e. Star, from Şú-sighir-lí, nine miles.

‡ The Turks are so vague in their pronunciation, that I have sometimes heard the same place pronounced quite differently by different persons.—A.

Kepsúd, (Jih. numá, p. 660,) pronounced *Kepít*.

§ Bólát. The Turks always sound the final medials as tenses, or, in other words, convert final *sonants* into *sarás*.

|| Bighádij (Jehán-numá, p. 661), though spelt thus, is pronounced Bighadich, with a strong emphasis on the *ich*. *Μαργαρίτς* in Greek.

in a fine plain, and with some insignificant remains of a castle of the middle ages near it. From Bigaditza to Singerlí, four hours, nearly S. Here I again crossed the river, flowing from the E., and continued up its bed, eighteen hours, almost due E., to Símáwul. Some of the scenery up this valley is very beautiful; the plains and banks of the river, and particularly such parts as are subject to frequent inundations, being covered with magnificent plane trees.

Three hours E. from Singerlí, I visited some hot springs, by the Turks called *I'ljah*,* a little way out of the road, which rise in several places out of an igneous rock, a grey porphyritic trachyte. Their heat is nearly that of boiling water, and they are heard distinctly bubbling up under the rocky and treacherous crust. The water deposits remarkably white stalactitic and stalagmitic concretions, and is accompanied by a strong sulphureous smell. The united springs form a stream large enough to turn several mills, and near the road, about a mile from the sources, the water is still hot enough to form a hot bath, much used by the natives.

From Símáwul I made an excursion to the lake which forms the sources of the Símáwul Sû. It is about five miles N.W. from the town, and the river flows at once from the western extremity of the lake a considerable stream. This lake is supplied by sub-aqueous springs, for no river of any consequence flows into it. The many small streams which I had crossed in my way to Símáwul flowing down from the high range of Demirjî, on the S., are all absorbed by irrigation before they reach the lake. Near the western end of this lake is a small insulated hill, round which are considerable remains of wall, but too much ruined to ascertain their age; and near it, as well as in the neighbouring village of Kiliseh kôî,† are many large marble blocks and fragments of broken columns, friezes, &c., and one or two imperfect inscriptions. I have no doubt that this hill was the Acropolis of the Phrygian Ancyra. In a Greek inscription which I found in the wall of the mosque at Símáwul the word Synaus may be read. That some ancient town existed in this neighbourhood is proved by the number of marble blocks and other fragments, which we saw in every village in the plain.

From Símáwul I crossed a high range of mountains, the eastern prolongation of the range of Demirjî, between four and five thousand feet above the sea, which has formed in former ages the northern boundary of the vast lacustrine deposit of the tertiary

* *I'ljah*, "hot-springs" in Turkish.

† *Keliseh kôî*, church-village; *Kilisýá*, as it is most correctly spelt, is from the Greek "ecclesia."

period which covers a large portion of Asia Minor; and in twelve hours, nearly S., we reached Selentí.* The river on which this town stands is not the Hermus, as it is called in all the maps, but the Aineh-cháï,† which does not join the Hermus until twenty or twenty-five miles lower down.

June 8th.—Selentí to Kúláh,‡ eight hours, nearly S.W. After leaving the valley of the Aineh-cháï, and crossing the mountains between it and the Hermus, which are chiefly horizontal beds of lacustrine and cretaceous marl, I entered the district of the Kata-kekaumené, and remained some time at Kúláh, examining the remarkable volcanic phenomena which this district presents, and making excursions to ascertain the extent of the various streams of lava which have flowed from the three modern cones or craters, and which correspond with the three pits described by Strabo.§

In one of my excursions I discovered the ruins of Saittæ, a celebrated town of Lydia, and of which a few well preserved coins are in existence. These remains are situated about nine hours N.N.W. of Kúláh. They consist of a stadium, one end of which is nearly perfect, between two low hills; but the northern end, which extends into the plain, is quite destroyed: numerous tombs and sepulchres in the hills around, and many massive remains of temples and other public buildings. Large broken columns lie about the fields and plain in all directions, and prove the magnificence of its ancient decorations. The modern name of these ruins is Sidàs ka'leh,|| which is probably a corruption of Sitas, the accusative of Sitæ, the name by which this town is mentioned in the Synecdemus of Hierocles. In a neighbouring village I found a few inscriptions, but none which contained the name of the ancient city, nor could I procure any coins there, although at Kúláh I had obtained several of Saittæ.

The height of Kúláh above the sea is considerable, perhaps 2250 feet, as the average height of the barometer whilst I was there was 27.680 inches; attached therm. 76°, and detached therm. 78° Fahr. The height of the volcanic cone is 530 feet above the town. It is situated in latitude 38° 31' N.

June 17.—I left Kúláh for Afyûn-Karâ-hişar,¶ with the intention of finding a middle road between the two I had already travelled, and to the north of the Mæander. It proved, however, a more difficult task than I had expected; for the country

* Selentí or Selendí, J. n. p. 632, 633.

† Mirror-stream, or rather Aineh River, i. e. the river from Aineh.

‡ Kúláh, J. n. p. 633.

§ Strabo, xiii. p. 628. Δείνυνται δὲ καὶ βόθροι τρεῖς οὗς φέρεται καλοῦσθαι, ὅσων τινεσὶ ἀπὸ ἀλλήλων διαστήταις σταδίων. "Three pits are shown, which they call 'bellows,' distant from each other about forty stadia (five miles)."—A.

|| Sidàs ka'leh, Sitas Castle. This T is pronounced D by the Turks.

¶ Opium-black-castle. Karah Hisar-Şâh ib. J. n. 631.

between the Mæander and the hills of Takmák, which is a continuation of the extensive undulating plain between Góbek and Sejikler, is cut up by many deep and precipitous ravines, some of which are from 400 to 500 feet deep. Through two of these ravines, rivers flow into the Mæander, of which the Bánás-chái* is the most considerable. It rises at the S.W. foot of the high mountains near Kútáhiyah, called Morád Tágh; the other is much smaller, and its course is more to the westward.

June 18.—After travelling all day over this plain, we reached a large village called Medereh Kóí, situated at the S.E. extremity of the plain, and distant by road eighteen hours from Kúláh nearly E.S.E. Very near this place, the Mæander, after winding through a chain of hills of mica-schist and saccharine highly crystalline limestone, which separates this large plain, which I think may possibly be the Cyri Campus,† from the Chál‡ district, enters the southern part of the plain, flowing through a rocky gorge, 600 or 700 feet deep.

The Chál district, through which I proceeded to Demirjî Kóí,§ the residence of the governor, is a rich and well-cultivated oval plain, watered by the Mæander: it measures about fourteen miles from N. to S., and four or five from E. to W. Its principal produce is the vine. The plain is entirely surrounded by high and steep hills, to which the ground of the valley rises gently all round, and it bears undoubted evidence of having been a large lake. The Mæander both enters and leaves this plain through very narrow ravines.

June 20.—Crossing the high hills which form the eastern boundary of this plain, I descended into another larger and more level plain, equally watered by the Mæander, at a higher level than the former; this plain, which extends the whole way to Isheklî,|| distant nine hours from Demirjî Kóí, my course being nearly N.E., is not improbably the Peltenus Campus. At its N.E. extremity, immediately behind Isheklî, rise the fine springs mentioned by Pococke, probably the ancient Glaucus, which at once form a considerable river, and flowing S.E., soon join the Mæander, flowing E.N.E. from Dineir. These two branches alone constitute the Mæander, or Menderes-sû, with the exception of a few small springs which rise at the foot of the high limestone mountains, which extend the whole way between Isheklî and Dineir. The Obrimas, as marked in Cramer's map, does not exist.

June 22.—Crossing another high range of mountains, and

* River of Bánás.

† Cyri campus.—Cramer, ii. 22.

‡ Chál: J. n. p. 633.

§ Demirjî kóí, Blacksmith's village.

|| Isheklî kóí, cleft-town, or sheikhî, i. e. Sheikh's town, J. n. p. 633.

partly ascending by the dry bed of a winter torrent, I reached the plain of Şandúklí;* the elevation of which above that of Ishiklí is very considerable. At Şandúklí itself are no remains of any importance, but in the centre of the plain the road passes through the undoubted ruins of an ancient town, situated eight miles south of Şandúklí. The remains consist of straight lines of the foundations of houses marking the lines of streets, and built of large blocks of stone; also part of a wall round the Acropolis, which stands on a low hill, in the rocky sides of which a few tombs are excavated, one of which had a Greek inscription. I also saw a few more sepulchral monuments in the burial ground of the village, which is built up among the ruins, but none of the inscriptions throw any light on the ancient name of the town.

From Şandúklí I crossed over a succession of high mountain-ridges, and passed through several perfectly flat alluvial plains, surrounded by the mountains, till I reached Afiyún Kará-hisár, situated in latitude 38° 44'. One of the most remarkable physical features of this part of the country is this constant succession of level plains, completely surrounded by high mountain-ridges, and bearing such strong evidence of having formed large lakes or inland seas at some very distant period.

June 24.—Started from Afiyún Kará-hisár for Kóniyeh.† This road has been described by so many travellers, that I need not enter into many particulars; but there are some points of which the geography still requires much correction.

Between Afiyún Kará-hisár and Bólávádín,‡ which latter place I did not visit, are remains of several ruined towns on the hill-side to the north of the plain; but although they contain fragments of marble columns, broken sarcophagi, and mutilated fragments of inscriptions, it is difficult to say whether they can safely be assigned to an earlier period than the Turkish conquests.

At I'ghún§ the lake, supposed to be that of the forty martyrs, and which, in Colonel Leake's map,¶ is called Trogitis, and is placed E.N.E. of the town, is, in truth, three or four miles to the N. by W. Ak-shehr|| is Philomelium; and I much doubt whether I'ghún be on the site of any ancient town.

The Turkish burial-grounds of Khánım khánah,¶¶ and walls of the khán, are full of numerous inscriptions, chiefly sepulchral, and either themselves mark the site of an ancient town, or are derived from a site which I visited in the hills to the south, about six miles off, where I found the ruins of an ancient castle,

* Şandúklí, Trunk-town, J. n. p. 641.

† Kóniyeh (Iconium), J. n. p. 615.

‡ Bólávádín, J. n. p. 631, 671.

§ I'ghún, J. n. p. 619. I'ghán, Ibid. p. 671.

|| Ak-shehr, White-town, J. n. p. 619.

¶¶ Khánım khánah, Lady's House.

crowning the summit of a lofty hill, which may have been an Acropolis, and among the stones of which were several inscriptions, which resemble, both in character and appearance, those at Khánum khánah.

At Ládík,* the ancient Laodicea Combusta, are also numerous inscriptions, but chiefly sepulchral. It has been supposed that this town received its appellation of Combusta from the volcanic nature of the surrounding country, in the same way as the Katakecaumené: this is, however, a mistake, as all the mountains, which almost surround the town, consist of a blue semi-crystalline limestone, and a few associated beds of shale and schist.

On the 29th of June I reached Kóniyeh, the ancient Iconium, in latitude $37^{\circ} 56' 30''$. The mean of the barometer during several days was 26·400 in.; the weather oppressive, with constant thunder storms. From thence I intended to strike due north for the salt lake† of Kóch-hisár.‡ I had in vain attempted to leave the high road for that place at Afiyún Kará-hisar, Akshehr, and I'ghún, having everywhere found it impossible at this season of the year, when, I was told, the springs across the intervening country were dried up, and the nomade tribes had left the plains for their summer residences in the mountains to the north and east. At Kóniyeh I found the same difficulties, and was obliged to go from thence to Kará-buñár,§ on the road to Ereglí; thence strike north to Ak-serái, and from thence north-west to Kóch-hisár.

I may here mention, that the high-peaked mountain which Colonel Leake saw from near Kóniyeh, and believed to be Mount Argæus, cannot be that mountain, but is the summit of Hasan Tagh, situated eighteen miles S.S.E. of Ak-serái, and presenting an appearance very similar to that of Argæus.

At Kará-buñár I left the great Hajj, or Pilgrim road, which leads from Iconium to Ereglí and Tarsus, and proceeded nearly N. by E. sixteen hours to Ak-serái. I may observe, that when I crossed it, the great plain to the eastward of Kóniyeh was perfectly dry; but in winter it is flooded and impassable. The route, therefore, is then along the foot of the hills to the north. I was much struck with the remarkable appearance of the *mirage* in crossing this flat plain. Several times we thought ourselves on the very borders of a lake, which appeared not half a mile off; and on the surface of which I saw the reflection of the distant

* Lásikiyehi karamán, also called Yúrugán Ládík (J. n. p. 616), i. e. Ládihiktyeh (Laodicea) of the country of Karamán, or the Gipsies' Ládík.

† Memliyah, or Tüzlah.

‡ Kóch-hisár, or Champion-Ram castle, J. n. p. 620, 626, 646.

§ Or Karah-biñár, Black Spring, J. n. p. 616.

mountains, but the whole appearance vanished as we approached. I always, however, found that some slight irregularity of ground was necessary to produce the appearance, and also that the hills which bounded the horizon must be very low. *Ķarâ-bunâr* is undoubtedly upon the site of *Baraté*, of the Itineraries, which I am inclined to look upon as a corruption of *Barathra*—a name derived from the deep volcanic craters or pits which surround the town. The town of *Ķarâ-bunâr* was completely abandoned, except by the *Menzilî** and his people; the inhabitants had all gone off to their summer quarters in the mountains, for the sake of pasture for their flocks and herds, and to avoid the plague of gnats, which made their town almost uninhabitable.

Ak-serâi,† in lat. 38° 20' N., is situated in an open and well-cultivated valley, through which a small stream called the *Beyâz sũ*‡ flows into the salt lake of *Kôch-hişar*. *Madder* is grown in great quantities in its neighbourhood; and I also saw a few fields of rye (*châvdâr*).

July 8.—I made an excursion to some interesting ruins about eighteen miles S.E. of *Ak-serâi*, at the foot of *Hasan Tâgh*, and on the road from *Ak-serâi* to *Bôr*,§ or *Tyana*. If *Ak-serâi* is *Archelais*, it is probable that these ruins are the remains of *Nazianzus*. The place is called *Vîrân-shehr*,|| or *Yûrân-shehr* (ruined town), and is situated on a rocky platform immediately above some fine copious springs, which form a long and deep lake, out of which flows a small river, which joins the *Beyâz sũ* of *Ak-serâi*, and also falls into the Salt lake.

The streets and houses of a great part of the town are still standing, the walls in some places being twenty or thirty feet high, entirely composed of rough cyclopean blocks, without any cement or mortar. The walls of the *Acropolis* may be distinctly traced, besides some curious vaulted buildings of more regular masonry. The tombs, which are very numerous, are generally better built, and more in the Hellenic style. Those which I entered had usually two rows of stone benches round them for receiving the dead bodies, and in one I found several human bones. Besides these buildings, I saw the ruins of three Byzantine churches of very ancient and rude construction, but evidently of a much more recent age than the rest of the town, being built with a good deal of mortar and small rubbly stones.

July 11.—I started from *Ak-serâi* for *Kôch-hişar*, along the plain, following the course of the *Beyâz sũ*, about sixteen miles the first day, nearly W.N.W. A short way farther on, the river

* Innkeeper.

† White water.

‡ White Palace, J. n. p. 620.

§ *Bôr*, J. n. p. 617.

|| *Yûrân* is a corruption of the Persian word *Vîrân* or *Urân*. *Bel-vîrân*, J. n. p. 617.

becomes salt, and on the following day we could find no fresh water until we reached Kóch-hişár, about thirty-two miles N.W. by N., and situated in latitude 38° 54' N.

The Salt lake* begins about five miles to the west of Kóch-hişár, and is said to be thirty leagues in circumference. The remains of the causeway which was built across an arm of it by Sultán Selim, are nearly concealed under an incrustation of salt; and at the spot where I reached the shore, the bed of the lake consists of a thick crust of solid salt. The salt itself is a government monopoly, and is farmed by Hájí 'Alí Páshá of Kóniyeh, for twenty-six purses a year (135*l.*), who sells it again for about thirty-four purses (177*l.*). The salt is collected at only four places round the lake, at each of which a receiver is stationed. The Turks who come for it, pay forty párahs,† equal to 1 piastre, or not quite 2½*d.*, for an 'arabah or cart-load drawn by two oxen; 10 párahs for a horse, mule, or camel-load; and 6 párahs for an ass-load.

The water of this lake is so extremely salt that no fish or other animals can live in it: birds dare not even touch the water,—their wings become instantly stiff with a thick crust of salt; and anything thrown into the lake is soon covered with that substance.

July 14.—Started for Cæsarea. The country, more hilly and better watered for some distance, is only inhabited by Turkománs, who, although like Yúruks‡ and Kurds, they live in tents during the summer, have generally fixed villages for their winter quarters. They are by far the most numerous and most civilised of the nomade tribes of Asia Minor. The Yúruks live in tents all the year round, but dwell almost exclusively in the mountains; and when in the neighbourhood of large towns, generally act as charcoal-burners, and supply the inhabitants of the town with that article: they, as well as the Turkománs, sometimes cultivate a little ground. The Kurds differ much in manners and in language§ from the two last tribes. They are a more wealthy, independent people, and live entirely in tents. They dwell on the eastern flanks of Mount Argæus and in the great plain of the Háimáneh,|| towards Angora.

July 16.—Reached Tátlar, a remarkably-situated village in a deep ravine of white, sandy, volcanic tuff, the steep sides of which are, in places, covered with large fragments of black basalt, with which the flat summit of the hill is capped. Many curious caves, and even modern dwellings, are excavated in this soft sand, in

* Túzlah, i. e. Saltern, in Turkish; Memlihah, in Arabic.

† Though spelt párah, i. e. "piece," this word is pronounced *pará*.

‡ Wanderers, from *yúrume*k, "to march about."

§ The Kurds speak an ancient Persian dialect; the Yúruk and Turkománs, Turkish.

|| Háimáneh, J. n. 620, 644.

which many of the inhabitants now dwell. Some of them appear to have been ancient tombs, others are evidently chapels of the earliest Greeks, and may perhaps have served as places of refuge during the persecutions in the early ages of Christianity. In one of them I found a curious old Greek manuscript, much worn and damaged, respecting which the Turks had told me many strange and marvellous tales.

July 18.—I left Nemb-shehr,* and passed through U'ch-hisár† and Urgúb,‡ near both which places, I was much struck with the remarkable conical and pointed hills, varying from 1 to 300 feet in height, which may be said almost to fill the valleys, they are so close and numerous wedged together.§ Most of them are excavated either as ancient Greek tombs or chapels of the early Byzantine period, or serve as modern houses and dove-cotes. Many entire villages are built among them. The only tree which grows upon this pumiceous soil is the apricot, which appears to be indigenous, and grows in great quantities. Some of the varieties of the fruit, although small, are very high-flavoured.

From Urgúb I ascended several miles, nearly due east, up a deep and narrow ravine watered by a small stream, on each side of which, were rich and well-cultivated gardens and orchards, extending as high up the hills on each side as they could carry a supply of water, which everywhere marks the limit of cultivation in this part of Asia Minor.

July 19.—At 5 A.M. I left Baktásh, which is called half-way between Nemb-shehr and Cæsarea, or Kaïsariyeh, the whole distance being computed at eighteen hours or fifty-four miles. Leaving the valley, which I had followed up from Urgúb, I crossed a high ridge of volcanic sand-hills capped with basalt, and descended upon Injú-sú,|| from whence, winding round the N.W. foot of Argæus, I reached Cæsarea soon after 3 P.M. Six miles to the westward of Cæsarea, and in the plain at the foot of Mount Argæus, is a small lake abounding in fish and water-fowl, from which all the maps, except Major Rennell's, make a river flow into the Euphrates, passing either to the north or south of Cæsarea. This is quite wrong. A considerable river falls into the north end of this lake, flowing through a rich and well cultivated plain from the north-east, and the river which issues from it flows through a deep and narrow valley to the W.N.W., and falls into the Halys. It is called the Kará-sú, or Black-water, and is undoubtedly the Melas of Strabo, which

* Nemb or Neb-shehr, a corruption of Nev, Neú, or Nau-shehr (New-town).

† U'ch-hisár, Three castles.

‡ Urgúb, J. n. 617.

§ The description of these conical hills given by Paul Lucas is not in the least exaggerated.—A.

|| Injú sú, Pearl-water. Injú is often pronounced Injí.

was dammed up by King Ariarathes, and which, on the bursting of the dyke, flooded the lands of the Galatians by causing the Halys to overflow its banks, and for which damage the King was condemned by the Romans to indemnify the Galatians. Strabo, or some one of his copyists, has evidently written Euphrates instead of Halys, by mistake, for how could the rising of the Euphrates have flooded the lands of the Galatians?

The heat at Cæsarea was very great while I was there, from the 19th to the 26th July, the thermometer in-doors generally averaging 86°—88° Fahr., notwithstanding its elevation above the sea, which is about 4200 feet. The barometer varied during my stay there from 25.568 in. to 25.328 in., and at Smyrna during the same time from 29.986 in. to 29.820 in., without corrections. The boiling point of water was 204°. 45. Cæsarea is situated in lat. 38° 42'.

July 27.—After many inquiries and contradictory reports as to the easiest side for ascending Mount Argæus, and having satisfied myself that this could only be done from the southern side, and that Everek-kōi, a large village at the S.E. foot of Argæus, was the only place where I had any chance of procuring guides, I started from Cæsarea, and halted for the night at the Greek convent, where I obtained much curious geographical information from the monks and the bishop, or despotes,* and reports of many ruins existing to the east and south-east of Cæsarea, but in a wild, inhospitable, and mountainous country, nominally under Ibrâhîm Pâshâ; all the inhabitants of which are reported to be robbers, and who often make incursions into the Turkish territory, and carry off the cattle of the more peaceable inhabitants of the plains. This convent is ten miles E.S.E. from Cæsarea, and about 1000 feet above the plain.

July 28.—My journey this day was round the eastern side of Mount Argæus. On this side, the mountain does not rise at once from the plain, as on the other sides, but is connected by rugged hills, with several lower ranges of mountains, which stretch away far to the eastward. I reached Everek-kōi in the evening, after eight hours' journey, and with the assistance of the governor (who lodged me in his own house, and gave me every facility in his power for effecting my purpose of ascending the mountain), soon found some Armenians who said they knew the way up the ridge, which forms, as I had seen on this day's journey, the lip of a large and extinct crater, but added that they had never been to the summit.

July 29.—With my Armenian guides and some Turkish

* Dhespôtis, *Δεσπότης*.

guards, whom the governor insisted on my taking, and my interpreter, I started for the mountain early this morning. It rises up almost to a single peak from a broad and extended base, consisting entirely of volcanic rocks and scoriaceous cinders of different kinds. Its sloping sides are studded all round with numerous cones and craters, the effects of volcanic action at different periods. Near the foot of the mountain is a little cultivation, but a few solitary wild pear-trees or stunted oak-coppice are the only trees upon it. Its appearance is, therefore, peculiarly barren and rugged, which, added to the black and cindery nature of its rocks, gives it a wild and inhospitable look. I was unable to reach the summit this evening, and indeed there is considerable danger in ascending the steep part of the cone after the sun has thawed the surface of the sloping sides, when large masses of rock are detached, and roll down the ravines or over the snow. We halted for the night under a projecting rock, where I found a hollow space just big enough for me to lie down in, while my followers accommodated themselves beneath a similar one. This was at the foot of the snow; indeed we had left several patches of it in the ravine below us, and a cold place it was during the night. The thermometer at 6 P.M. stood at 47° ; the barometer at 20.198 inches; indicating a height of about 10,300 feet as the lowest limit of the snow line, in the parallel of $38\frac{1}{2}^{\circ}$, N.

July 30.—5 A. M. Bar. 20.246.; ther. 35° : det. ther. 33° Fahr. Such was the dilatoriness of my Turks and Armenians, that the sun was well above the horizon before we started, notwithstanding the absolute necessity which they said existed for our being up before the ground thawed. After half an hour's walking up a steep, inclined plain, at an angle of 15° — 20° , we reached the snow, which continued unbroken to the summit. On this southern side several sharp ridges rise through the snow, over which we contrived to climb, occasionally crossing the intervening ravines of snow, where, as the warmth of the sun was felt and thawed the surface, many masses of rock, detached from the soil by the melting of the ice, came bounding past us at a most rapid rate. This is the only danger attending the ascent of the mountain. Two hours' more very steep walking and climbing brought us to the summit. This consists of a narrow ridge, the highest point of which is nearly the point of junction of two large and contiguous craters, both of which are broken down on the north side. The snow in them is very deep and unbroken, and descends much lower than on the southern flank, forming extensive glaciers, resembling those of Switzerland; but such is the porous nature of the rocks and soil, that, however fast the snow melts, no streams of water flow down the sides of the mountain, but are all

instantly absorbed. The bar. on the summit was just below 18 inches, and the ther. 40° Fahr. This gives a height of 13,300 feet, which I believe to be nearly correct, as it agrees very closely with the result of two angles of elevation taken from different spots below the mountain; one of which, taken from the Greek convent (the height of which, calculated by the barom., is 5200 feet above the sea), makes the height of the mountain 13,242; and the other, taken from Kará-hişár (the height of which, measured by the barom., is 4300 feet above the sea), makes the whole height of the mountain 12,809 feet.

Taking a mean of these three observations, we shall not be far wrong in estimating the height of this celebrated mountain at 13,100 feet above the sea.

At the spot where we spent the night, scarcely any vegetation was to be seen: a few small stunted Alpine plants grew among the stones, and I found one small plant, with a flower resembling the thistle, but growing low and spreading, and the leaves smelling strongly of musk, which, the Turks declared, was found nowhere else. They ascribed some rare medicinal virtues to it.

I was disappointed in my expectation of a distant view. The day was hazy, and a sea of clouds floated far below us, obscuring the surrounding country from our sight, except when high ranges of hills appeared, like islands above the waving clouds; consequently I was unable to take many angles or bearings of distant places.

Descending from the mountain I found, near the edge of the plain, the ruins of a town, which, at some period of the Byzantine empire, must have been of considerable importance, to judge from the remains of several old Greek churches, columns, and tombs which appear on the hill-side near the modern village of Gerameh. Returning from these ruins to Everek-kói, we had a narrow escape from a large band of well-mounted Kurds, returning from a predatory excursion, whom we saw descending from the mountain-side at full gallop, and driving before them across the plain large herds of beasts and cattle which they had just been plundering.

July 31.—From Everek-kói to Kará-hişár, eight hours, across a flat plain, wet and marshy in places, and which is almost entirely under water in winter. At Kará-hişár I found no antiquities; but on the following day, August 1, I made an excursion about eight miles to the westward to some ruins, called Sowánlí Dereh, where I found a very remarkable valley, the steep and almost perpendicular sides of which were, for nearly two miles, excavated into an immense number of chambers, grottoes, dwelling-houses, tombs, and chapels of the Byzantine age. From its

position and similarity of name, I have no doubt it occupies the site of the ancient Soandus, which is mentioned by Strabo (xiv. p. 663) as on the great road from Phrygia through Lycaonia, to the capital of Cappadocia.

August 2.—Starting from Kará-hisár, I proceeded along the usual road to Nigdeh, Bór, Kilisá Hisár, and Ereglí, and reached Mislí* in five hours, at nearly eight the same evening.

August 3.—I left Mislí early for Nigdeh, five hours, S. S. W. Mislí is a small village of Greeks, subject to the Bishop of Nigdeh, and quite independent of the Turkish authorities. They pay no taxes to the government, in lieu of which they formerly worked the lead-mines of Ma'den Tágh, about six hours off, E. by S. Now, however, they pay their contributions to these mines, instead of working them, and the miners are procured from Gúmish-khánah, between Trebizond and Erz-rúm, the place which supplies most of the miners of Asia Minor. These Greeks of Mislí never leave their village, and neither man nor woman is allowed to marry a stranger, or any one not belonging to the village.

Seven miles before reaching Nigdeh, some very copious springs rise in the low flat valley, and form a stream which flows through Nigdeh and Bór to the S.W. This stream serves to irrigate some rich meadows and gardens; and about five miles above Nigdeh to the N.N.E. is a place called Eskí Andavál, or Old Andavál. There now only remains a small Byzantine church, dedicated to St. Constantine; but the surrounding country at once strikes the traveller as being the spot alluded to by the author of the "Jerusalem Itinerary," in the words following Mansio Andavalis, sixteen miles from Sasima, and on the road to Tyana, from which last place the "Antonine Itinerary" gives it a distance of sixteen miles.† These words are—"Ibi est villa Pampali unde veniunt equi curules." The valley is most remarkable for its freshness and verdure. There is no other spot in the country more fitted to the breeding of horses; and here was probably the stud of Pampalus, or (as they are supposed by the critics to have been one and the same person) of the Palmatius, mentioned in the Glossæ Nomicæ of the Lower Empire, whose breed of horses, extensive landed property, and magnificent palace at Cæsarea nearly equalled the splendour of the Emperor Valerian. There is also a modern village of Andavál, about two miles off to the east of Nigdeh, amongst the mountains.

August 4.—Twelve miles S.S.W. of Nigdeh, I passed through the town of Bór, on the banks of the same river; and two m

* Brazen or Brass-place.

† See Wesseling's Note to the "Jerusalem Itinerary," p. 577.—

farther south I reached the small village of Kiz-hisár, or Kilisá-hisár. The remains of antiquity in the village and its neighbourhood have long since made it probable that it is the site of Tyana; but no inscriptions have been found there which throw any light upon its ancient name. Nevertheless, one or two material features, which I observed in its vicinity, are so remarkable as to leave no doubt upon the subject.

One of these is the circumstance that the town is built upon a small rising mound or hill in the middle of the plain, which exactly corresponds with the description of Strabo, who says* that it was built upon the mound of Semiramis. It was in order to convey water to the summit of this hill that the aqueduct built apparently by the Romans, and which extends for several miles across the plain, from a rich and copious spring to the eastward, was originally intended. Numerous remains and foundations of ancient buildings exist amongst the walls of the small cottages upon this hill; and amongst others is part of the floor of an ancient Doric temple, with one slightly fluted column still standing *in situ*.

The other circumstance is the existence of a very singular lake in the plain about two miles south of the town, which answers to the description of the fountain of Asbamæus, recorded by Ammianus Marcellinus,† and by Philostratus in the life of Apollonius Tyaneus.‡

Ammianus says that there is a fountain which rises in a marshy plain near Tyana, which swells with the quantity of water, and again disappearing, never overflows its banks.

Philostratus says that near Tyana is the fountain of Asbamæus, sacred to Jupiter, which rises very cold, but it bubbles up exactly like a boiling cauldron.

The apparent discrepancy of these two accounts vanishes on seeing the real phenomenon, which perfectly bears out both descriptions. About two miles to the south of the village several small springs of brackish water rise, and a little way on is a small lake or pool, about thirty or forty feet in diameter, of turbid brackish water, which appears to be boiling up all over, but particularly in the centre, where a violent jet of water rises to a height of nearly a foot, and about a foot and a half in diameter, with considerable noise. Notwithstanding this quantity of water which is constantly boiling up, the lake never rises or overflows its banks, nor does any stream of water escape from it, although the ground around is perfectly flat. There is a slight smell of sulphuretted hydrogen gas around it; and I think it probable that the jet in the centre of the pool is partly caused by the escape of a large quantity of gas, and not solely by water.

* Τὰ δὲ Τύανα ἰσχύεται χάματι Σιμεράμιδος τοῦτοχισμένη καλῶς. Lib. xii., p. 538.—A.

† A. Mar. lib. xxiii. c. vi.—A.

‡ Phil. de Vit. Apol. lib. i. c. 6.—A.

Another evidence of this being the site of Tyana may be found in the name of a low chain of hills to the north of the town, in which are several caves and tombs excavated, which hill is called Ifi'yáncas, or Ifi'yán-keler—the last syllable being perhaps a corruption of the Latin *castrum*, or the Arabic *kal'eh*.

August 6.—Between Eregli or Ereklí and the Bín-bir-kilisá,* on Kará-tágh (Black Mountain), there is a large swampy lake in the great plain, which appears to be a continuation of that of Kóniyeh. This plain is bounded on the south by a low chain of hills of secondary limestone, which stretches down from Mount Taurus; and in passing between these mountains and the lake, I was surprised to find a stream flowing to the south out of the lake, and escaping through a chasm or Katabothron at the foot of the cliffs, thus affording an outlet to the superabundant waters of this plain, which was not suspected to exist.

The stream was not very considerable when I passed it; but it was evident, from the wide bed of the torrent, and the unusual circumstance of the Turks having built a substantial bridge over it, that in winter and spring a very large quantity of water must escape by this subterranean channel.

I halted this night at an encampment of Turkománs, near the lake which is called Ak-Gól.† The winter residence of these Turkománs is at a village eight hours off to the south, called Devlí, which is probably the ancient Derbe, which we learn from Hierocles was called Delbia, from which the change to Devlí is most simple—Delbia, Delbe, Delve, Devle. I was assured that no water is found within eight hours' journey of it at this time of year, which prevented my visiting it.

August 7.—On my way to Kará-dagh due west, I passed through the ruins of two ancient towns, one of which is marked by the many ancient tombs excavated in the rocks, on the side of one of which I found the remains of a Greek inscription; and the other by the numerous ancient blocks and broken columns of marble built into the walls of every cottage.

August 8.—Visited the ruins of the Bín-bir-kilisá on Kará-dagh. They are very extensive and interesting, covering a large space of ground; but, with the exception of the many large sarcophagi and tombs, resembling those of Hierapolis, appear to belong entirely to the early ages of Christianity. The ruins consist chiefly of the remains of Byzantine churches, evidently of great antiquity, and some of very considerable size. They are without exception built of the red and grey porphyritic trachyte of the neighbouring hills. I am inclined to attribute these ruins to Lystra, which we know was an Episcopal See under the Byzantine Emperors, which well accords with the existence of so many ruined churches;

* Bín-bir kilisá, i. e. 1001 Churches.

† Ak gól, White Lake.

whereas Derbe, which has hitherto been supposed to be at this place, is not even mentioned by the Ecclesiastical Notices.

August 11.—I left Karamán* for Beg-shehr,† and at Kasabah,‡ four hours from Karamán, leaving the road to Kóniyeh, turned off due west, with the intention of passing through the ancient province of Isauria, and with the hopes of finding some remains of the old city of Isaura, which I had understood from M. Texier was at Beg-shehr. I halted this night at a small village, called El-másún, four hours west from Kasabah, and learnt, during the evening, that eight hours farther west, and almost on the line of road to Beg-shehr, were some extensive ruins on a lofty hill, near the villages of Ulú-bunár§ and Hájilar.||

The most remarkable feature on our journey this day was the number of ruined Turkish villages and towns, the date of whose prosperity was probably during the time of the Sultáns of Iconium and Karamán-ilí; and their destruction appears owing to the numerous Nomad tribes, who now inhabit these plains during the winter.

El-másún is situated almost at the foot of the high hills, which may be supposed to form the eastern boundary of the mountainous district of Isauria, which commences immediately to the westward. Low undulating hills extend to the N. E., sloping gradually down to the plain of Kóniyeh.

August 12.—El-másún to Hájilar, eight hours. The greater part of the road through a wild and thickly-wooded country, with rocky hills and deep ravines, agreeing with the historical description of the fastnesses of Isauria. On reaching Hájilar I was disappointed at the contradictory accounts which I heard of the ruins in its neighbourhood; but, thinking that it would be best to judge for myself, I procured a guide and started for them at once. Fortunately I was quite rewarded by discovering them to be the undoubted remains of Isauria, the new town built by Amyntas, and surrounded by a massive wall, with lofty hexagonal towers, beautifully constructed, and of a very peculiar style of architecture. The buildings within the walls are all in the same style, consisting of alternate courses of very thick and very thin blocks of marble. Amongst them is a handsome triumphal arch, with a Greek inscription, stating that it was erected in honour of Adrian by the senate and people of the Isaurians. The town is built on the highest point of a high range of hills, extending from N.W. to S.E., and commanding a most extensive view, even as far as the plains of Kóniyeh and the lake of Beg-shehr. Outside the walls are many tombs, from which, and in the neighbourhood of the forum, I copied several inscriptions. Some of these

* Karamán, or Karaham, i. e. Black House.—Otter, Voy. i. 59.

† Pronounced Bey-shehr, i. e. Lord's Town.

‡ Kasbah, i. e. Market Town.

§ Ulú-bunár, Great Spring.

|| Hájilar (Kóí). Pilgrimville.

tombs are excavated in the rock, others are large massive buildings erected with considerable magnificence on the side of the hill towards the south.

It would appear that the town was inhabited even in Christian times, as I observed on each side of the ancient road which leads up to the eastern gate of the town many rude sepulchral stones, with large crosses carved upon them.

I remained here the whole of the following day, and in the evening went about six miles W.S.W. to Tiris ma'den. The chief occupation of the villagers is smelting lead, the ore of which is brought in its rough state from the mines in Mount Taurus, about ten hours off to the south. A considerable stream flows through this valley to the N.N.E., but is absorbed or exhausted by cultivation before it reaches the plains of Kóniyeh. In winter only does it flow through into that plain.

August 14.—Tiris ma'den to Karáorán* seven hours. Karáorán is situated near the N.E. end of a large lake, to the S.E. of that of Beg-shehr, and into which a large stream from the lake of Beg-shehr† empties itself. It is sometimes called the lake of Seidi-shehr,‡ and sometimes of Soghlah. It is certainly the Trogitis of Strabo, as that of Beg-shehr is the Caralitis, the modern town of Kerálí being on its shore. This smaller lake of Soghlah§ is said to be sometimes dried up, the water escaping by a subterranean chasm near the foot of Mount Taurus, a range of which forms its southern boundary.

August 15.—Karáyurán to Seidi-shehr four hours, almost the whole way along the borders of the lake. Seidi-shehr contains from 400 to 500 houses. I here learnt that the plague was raging with great violence all the way to Smyrna, which, as I advanced, I found to be true.

August 16.—Seidi-shehr to Beg-shehr six hours. A high range of hills intervenes between the two lakes, and the river makes a great detour to the north in flowing from that of Beg-shehr into that of Soghlah. The water of the lake of Beg-shehr is perfectly fresh. Paul Lucas has evidently confounded this lake with some other, when he says that he saw the salt collected into heaps round its borders. There are several islands upon it, particularly at the northern end; but, as there was no boat, I could not visit them. The existence of these islands agrees with the account of the lake of Pusgusa alluded to by Dr. Cramer,|| and it is probably the same. At Beg-shehr the plague was bad; at Kerálí, which I reached the following day, still worse; and at Kará-aghách¶ three fourths of the population had died

* Pronounced Eurán according to the French orthography.

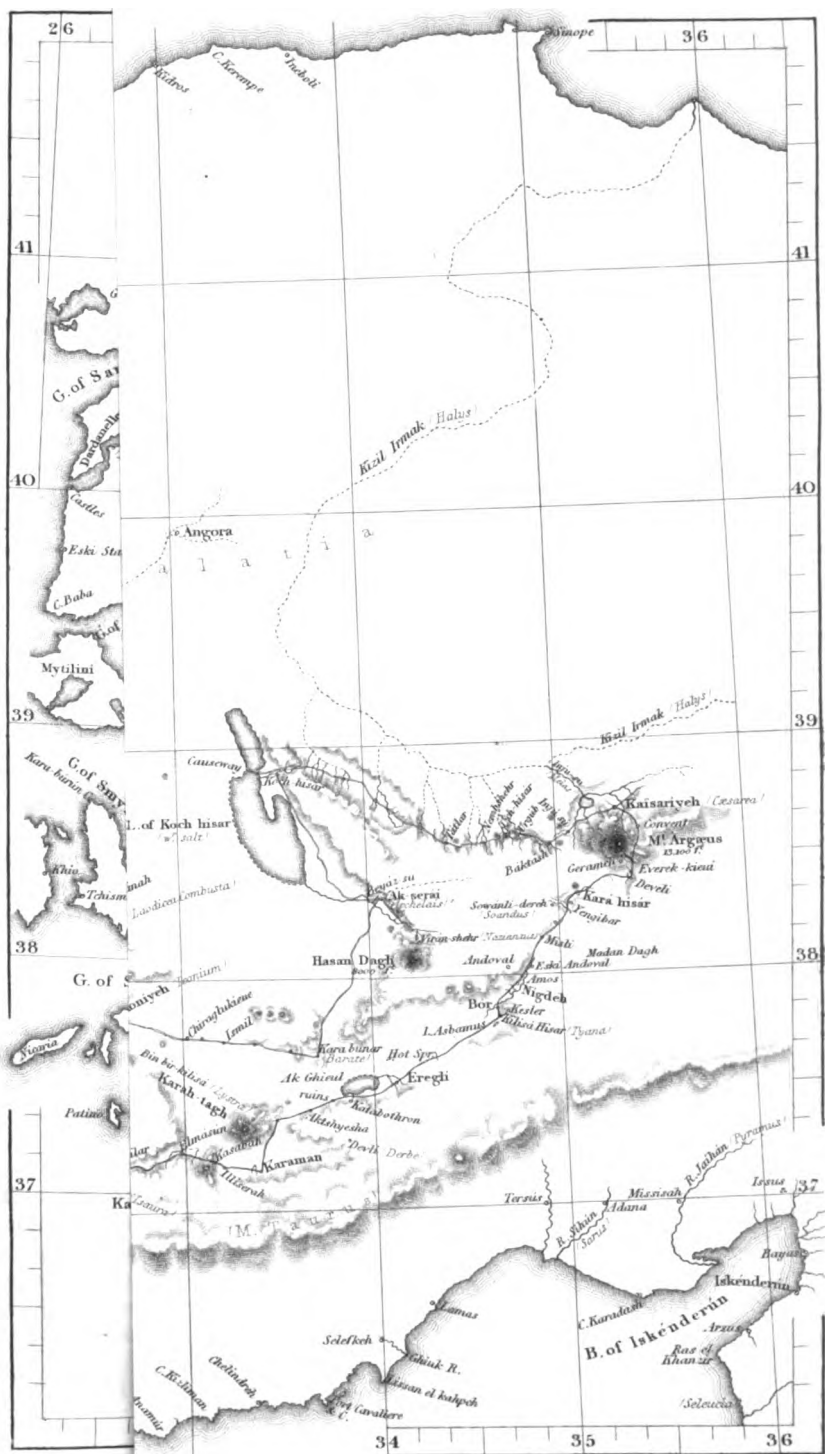
† Beg-shehr. J. n. p. 618.

‡ Seidi-shehr. *Ibid.*

§ Soghlah. J. n. p. 619.

|| As, Minor, ii. 77.

¶ Black Tree.



within the last three months, and the corn for many miles round the town remained uncut or uncarried. A more striking instance of the destroying character of this dreadful malady cannot be imagined, than this vast extent of uncut corn rotting on the ground, when you are told that not only there exists no one to claim it, but no one even to carry it away without a claim. The Governor might seize it as his own, but he could not find people to cut it, or carry it, or thrash it out. The very cattle have perished when tied up in the stables, because, when the owners were dead, there was no one either to feed them or to release them.

Under these circumstances, and hearing that the malady was raging with equal violence at Atáliyá, on the sea-coast, and throughout the intervening country, I determined to give up that part of my plan, and to return immediately to Smyrna by Ulúburlú (the site of the ancient Apollonia), Díneir, Isheklí, and Philadelphia; and, after a hurried journey, reached Smyrna on the 25th August.

XI.—*Considerations on the Political Geography and Geographical Nomenclature of Australia.* By Captain VETCH, Royal Engineers, F.R.S.

POLITICAL GEOGRAPHY.—The extent and boundaries of empires, states, and provinces, and the still lower political divisions of the earth's surface, have but too generally arisen out of accidental circumstances, mere caprice, or have been determined by impure and interested motives; so that the want of wise design and systematic arrangement in this department of politics is as manifest as it is unfortunate: for if we consider these divisions and subdivisions of States to be the organs and channels of government and links of social institutions, their defects cannot but prove highly detrimental to the true and complete administration of the laws, the peace and prosperity of the people.

It is indeed true that circumstances in many cases exist to prevent the establishment of political divisions on principle and system, but it must also be admitted that, in other cases, where neither difficulties nor obstacles presented themselves, the introduction of order has been equally neglected, and the omission not unfrequently only begins to be lamented when the measure is no longer practicable: much labour, expense, and trouble have then to be bestowed to remedy or palliate defects which a timely organization would have entirely obviated.

In no division of the globe could a system of political geography be introduced with so much ease, or with so many prospective ad-

vantages, as in that of Australia ; and it is under the above considerations that the writer would humbly submit to her Majesty's government the advantage of an immediate adoption of a systematic arrangement for that country, by establishing at once the whole of the grand divisions into which the continent of Australia may be most appropriately apportioned, and of laying down at the same time the plan upon which the minor divisions and subdivisions ought to be formed.

In approaching this subject, we have, in the first place, to consider that Australia is a continent 2500 statute miles in length, with an average breadth of half that quantity ; that it contains an area of 3,000,000 square statute miles, and that it is only one-sixth part less than the whole of Europe ; and, if we reckon the population of Europe at 186,000,000, Australia may at a future day, on the same scale of density, possess a population of 153,000,000.

It is very probable that the native population of Australia has been stationary for a great lapse of years, and that there is small chance of its increasing. But if we look to the activity of British colonization, and the progress which the colonists are making in multiplying themselves, we may, with great safety, believe that the increase of souls will follow an equal ratio to that which has occurred in the United States of America, or even greater ; because in Australia the ground requires much less clearing, and the obstruction from the natives is much less formidable ; there is, therefore, nothing unreasonable in the expectation, that the population and power of the Australians may, in two centuries, equal those of the United States of America of the present day.

From the above general view it will be apparent that such a vast territory with a proportionate population can only be ultimately well governed by the division of the whole into a number of distinct States, and that, whether these rival communities become entirely independent of each other, or whether they be held together by a confederation, it will in either case be important for their general peace and individual prosperity, that they be pretty nearly balanced in power and natural advantages, and that in forming the grand divisions the following points should be attended to :—

1st. That each should possess areas nearly equal.

2nd. That each should be as compact as circumstances will permit.

3rd. That each should possess a tract of sea-coast.

With the above objects in view, and with the knowledge premised that Australia is of an oblong figure, twice the length of its breadth, it will be apparent that there is only one mode of division that will attain the required conditions. 1st. By dividing the continent longitudinally into two equal parts, and transversely into

four equal parts, from which will result eight equal grand divisions ; at least such would be the case if this continent were somewhat more regular in its form. It happens, however, that its breadth towards the eastern shore is so considerably expanded as to offer the facility of dividing the eastern sea-board into three portions as conveniently as into two, should such become, on other considerations, a more desirable arrangement ; or, in other words, the form of the continent presents a facility of division into either eight or nine provinces, and of affording to each the conditions and advantages already proposed to be secured to them. But it also happens that to one province of Australia boundaries have been already assigned, by charter and by Act of Parliament, which could not be materially altered without much difficulty, and therefore rendering it necessary to endeavour to combine what is proposed to be done with what has already been performed.

If the limits and extent of the province named South Australia, as assigned by Act of Parliament, be assumed as fixed conditions in a system of grand divisions of the continent, it will not require much study of the map to show that a distribution of the land into nine rather than eight parts will most harmonise with the step which has been already taken.

Should it be proposed to divide the continent into a greater number of parts than eight or nine, it could only be accomplished by depriving some of the divisions of a sea-coast position, or otherwise, by constructing them of a long and narrow form, and departing from the compact shape so desirable for the easy and cheap administration of government. On the other hand, should it be proposed to make the number of divisions less than eight or nine, it must not be overlooked that, with a division into eight parts, each individual State would possess an average area of 375,000 square statute miles, or be of an extent one-fourth greater than Spain and Portugal combined, and that each may possess a population of 19,000,000 of souls, and consequently that a greater extent of territory and people would not be likely to ensure so good a government, or so much happiness to the people.

If from the foregoing reasons it be admitted that, in laying the foundations of a number of contiguous empires, careful design and systematic arrangement would tend to promote the future welfare of the inhabitants, and that an essential part of such design and system must consist in forming the grand divisions upon the principle above proposed, then it must also follow that the plan should be adopted and reduced to practice ere conditions or circumstances may arise to render the same either impracticable or difficult.

The accompanying sketch of a study for the grand divisions of Australia will serve to illustrate the author's views and aid his

explanations. On this subject he has at present only further to propose, that, should his views be deemed correct, not only should the adoption of some such similar division take place, but also that a colony or garrison, however small, should be at once established on some convenient part of the coast of each division.

By means of small garrisons, commanded in some instances by a person of no greater rank than serjeant, did Russia maintain some possessions or settlements on the west coast of America, although her original right to them might be somewhat questionable.

The utility of establishing these small garrisons of even a company of soldiers, or less, would be as follows:—

1st. The taking and maintaining possession, and consequently preventing disputes or even war with foreign powers in respect to right.

2nd. Serving as points of refuge and refit for vessels coasting either for trade or discovery, and these must shortly become numerous.

3rd. The acquiring useful information concerning the natives, and the capabilities of the country for future settlements.

4th. Constituting an organ of government, ready at any time to give effect to what measures may be deemed necessary in the progress of future settlements; and,

Lastly. They would be useful for advancing the geographical knowledge of large territories at present too little known.

In the accompanying sketch of the grand divisions of Australia, the boundaries are formed chiefly by means of meridian lines and parallels of latitude, and these, though not the most eligible as a frontier between hostile States, have several compensating advantages; they are easily described and precisely defined, and furnish the means of giving the required size and shape better than natural boundaries; and, lastly, they facilitate the system of allotment of the land, which has been followed with so much advantage in the United States of America.

Nevertheless, should it be found, in the progress of geographical discovery, that natural boundaries do exist somewhat contiguous with those of the imaginary lines, then it would, no doubt, be advisable to substitute the former for the latter. The only good natural boundary with which we are at present acquainted is perhaps that of the River Murray towards its mouth, where it might be advantageously substituted for the meridian line boundary at least, from the point of intersection of the two, down to the sea.

GEOGRAPHICAL NOMENCLATURE.—This is a branch of geography generally left to chance or caprice, and it will not be easy to find any department so left which has been more abused.

It might not be worth while to take much pains for the mere purpose of introducing a complete and faultless nomenclature. But good taste, and even common sense, is concerned in rescuing Australia from some barbarous and nonsensical names, which nothing but a positive necessity should tolerate.

Wherever native names exist, and where these names may have existed for a number of ages, it appears something like sacrilege to disturb or change them; such names, besides the sacredness of antiquity, are often significant, and contain in themselves useful information as to the migrations of the human race, and the former connexion which existed between tribes now far separated. Thus rivers in Australia may be found with names identical with others in America; native names possess this advantage also, that they are seldom vulgar or ridiculous, and they furnish a copious fund of distinctive terms to obviate the confusion which arises to geographical nomenclature in the repetition for the hundredth time of the rivers Thames, Trent, Tyne, &c., and it fortunately happens that in no country, however barbarous or thinly peopled, are the great features of nature, as rivers and mountains, without names; and the name of a river or mountain may be appropriately applied also to the district in which it occurs.

That Australia is not defective in native names, and of good sounding names, may be shown by the following random specimens, the freedom having been taken of curtailing the double letters, with which the English are so apt to encumber their orthography of unlettered tongues, and apparently to so little purpose:—

Monam	- Downs.	Anglicised Brisbane Downs.
Colaiè -	- a Morass.	„ Dalrymple's Marsh.
Morumbigi	- a River.	
Molonglo	- ditto.	
Paramata	- a Town.	
Waragamba	- a River.	
Kernok	- a River.	
Gelong	- a River.	
Tramo -	- a Down.	„ Oxley's Plains.
Pannara	- a Mount.	„ MacLachlam Mount.
Belubula	- a River.	
Waragong	- a Range of Mountains.	

We may now contrast the above with the following new names:—

The New Year's Range.	Tunbridge Hill.
Cockburn River.	Darling River.
McQuarrie River.	Reid's Mistaken Hill.
Encounter Bay.	Sir Joseph Banks' Island.
Peaked Hill.	Mount Disappointment.
Back Stairs Passage.	

It is presumed the above will suffice to show the inexpediency and impropriety of explorers placing their own names, or those of their patrons, in lieu of *existing names*, in every way preferable; and it would only be necessary for the ruling powers to express a wish that the native names should be ascertained as far as possible, and adopted, to establish that line of future proceeding.

Where towns and villages are to be founded, there can be no remedy against bad taste; but the founders may then indulge their fancy without interfering with names already sanctioned by age.

The Spaniards rarely attempted to change the Indian names in America, but contented themselves with providing a patron saint, and prefixing his name to the towns, which prefixes are now becoming obsolete; and if we contrast the Indian names of Peru and Mexico with the jargon of new and old names introduced in the United States of America, we shall have good reason to admire the better taste of the Spaniards.

That good native names were to be found in the United States as well as in Australia, we have only to recur to some that have been preserved—as the Ohio, Oswega, Ticonderaga, &c.—and to regret that a greater number should not have been handed down in place of the Brandy-Wine, and such like.

It is not, however, to be expected that we shall find any native name used to designate the entire of Australia, or even of any large portions of it, as the circumscribed knowledge and power of the present native races cannot be supposed to reach, or to have any motive for reaching, to so great a grouping of land.

The names of the whole continent and of its grand divisions must, therefore, necessarily be of modern invention or application.

The whole continent long went by the name of New Holland, until Pinkerton pointed out the absurdity of it, and Flinders suggested that of Australia, which has happily come into general use.

There can be no impropriety in calling a new town New Carthage, or New Orleans, &c., as colonised or founded from parent cities of those names; but the term “New” cannot with the same propriety be applied to the face of a country, or its features. The New Thames, or the New Tiber—the New Alps, or the New Grampians—would not be tolerated; and, upon the same principle, New Holland, New England, and New South Wales have only ceased to excite the smile (from use) which New Turkey or New Egypt would readily create.

The name Holland is descriptive of a low country, and the term is not applicable to Australia; but the further absurdity was embodied of naming a great continent from a small province—an objection which applies also to the term *New South Wales*, an example of a name consisting of a sentence, and implying the

necessity of designating the inhabitants by the names of New South Welsh men and New South Welsh women.

There are two names which have arisen lately to denominate two provinces of Australia which are hardly less objectionable than that of New South Wales. These are South Australia and West Australia. These names consist of two words in two different languages, and if put entirely into English would imply in one case a repetition, and in the other a contradiction, viz., South Southland and West Southland. Surely one language and one word might supply a better appellation than a confusion both of tongues and terms.

If we adopt the term Australia, as distinguishing it in its southern position from other continents, then, according to the usual system of classification, some other distinguishing character ought to be used for the genera than that for the classes. If, however, South Southland is a term meant to describe and distinguish a province, it will not effect its object, since the same name will be equally descriptive of three other provinces of Australia, and West Australia will be equally so of two of them.

The name in present use for the whole of the continent (Australia) is admitted to be good, nor would it appear a matter of much difficulty to supply simple and distinctive terms for the provinces, and if any such proceeded from a quarter of authority, no one would feel disposed to subject them to criticism, unless involving some manifest impropriety. The case, however, is much altered when a private individual ventures to cater for the public taste; he must be both prepared for criticism, censure, or sarcasm. The writer, having no predilection of his own in the matter, would have left the task to other hands, could he have seen any hope of its being so performed. If he, therefore, now ventures to undertake it himself, it arises from the consideration that we should otherwise *still* remain without the means of classifying the various parts of Australia; whereas by means of a system of division, and corresponding terms, we can at once refer any spot of that continent to its admitted place in the system, and which, if established for no other purpose than that of facilitating geographical description, cannot but prove of obvious utility.

The principle followed in selecting names for the great divisions has been that of doing honour to the most original discoverers of the respective portions, but preserving, at the same time, names which have been long attached to various parts; and if this principle has been departed from in two instances, the inducements for so doing will, it is hoped, be duly appreciated. Taking, therefore, the divisions as numbered in the accompanying map, and proceeding on the principle alluded to, the following terms are very humbly submitted for adoption:—

I. DAMPIERIA. In honour of the intrepid and celebrated navigator who, in 1688 and 1699, explored some of the coast in this quarter, and whose name is still attached to an Archipelago, and a tract of the shore comprised in this division.

II.—VICTORIA. In honour of our gracious Queen, under whose auspices it is to be expected, the great Australian empire will receive a form and development corresponding to its magnitude and prospective importance.*

III.—TASMANIA. In honour of the celebrated Dutch navigator, *Abel Janz Tasman*, who, in his second voyage in 1644, discovered the whole of the N.W. coast from lat. 11° to lat. 18° south.

IV.—NUYTSLAND. In honour of *Pieter Nuyts*, who, in the ship, *Gulde Zeepaard*, in 1627, discovered, and ran along 1000 miles of the south coast, and to which his name has long been most justly affixed.

V.—CARPENTARIA. So named from the great Northern Gulf, said to have been so called from the Governor-General *Carpenter*, who, in 1625, was Governor over the Dutch East India possessions.

VI.—FLINDERSLAND. In honour of *Flinders* the eminent navigator, to whose enterprise and surveys we are so much indebted for our knowledge of the shores of Australia, and whose name as a discoverer is especially connected with this division.

VII.—TORRESIA. In honour of the Spanish navigator *Torres*, who discovered this portion of Australia in the year 1606, and whose name is deservedly attached to the straits situated at the north cape of this division.

VIII.—COOKSLAND. In honour of our celebrated circumnavigator, who, in 1770, discovered and examined a great extent of the eastern coast, and from whom, therefore, this division may with much propriety derive its name.

IX.—GUELPHIA. In honour of King George the Third, the zealous and munificent patron of geographical discovery, and under whose auspices the first settlement of the British in Australia took place, in the year 1788.†

Before quitting the subject of Australian geography it may not be misplaced to express regret and even surprise that so little

* The names of the navigators Edels, Vlaming, Vancouver, and D'Entrecasteaux, claim to be recorded in the subdivision of this province, but as it would be difficult to apply any one of them to the whole division without committing an act of injustice to the others, a fit opportunity presents itself of doing honour to our august Sovereign and Patron of the Geographical Society.

† The name of New South Wales, long associated with this quarter of Australia, has been shown to be in many ways objectionable, and a fit occasion therefore occurs of honouring the memory of our Third George, in whose reign possession of the country was taken, and a new continent added to the British empire.

progress has been made in the inland discovery of a country where the general climate is so mild, and where the native hostility is so little formidable.

It is now half a century since the first settlement of the British in Australia was effected, and we may still say that we know little more than the sea-coasts. The face and features of the central regions are still matters for conjecture, and the geographer is still anxious to learn whether the great hiatus has to be filled up with lofty mountains or with lakes and marshes, whether dismal swamps or arid wastes may forbid the settlements of man, or fertile plains and rich valleys invite his approach.

British enterprise and perseverance have explored the frozen shores of North America amongst all the dangers, privations, and difficulties which the extremity of cold can inflict, and the same qualities have carried our daring travellers into the heart of the burning and pestilential climate of Africa, in the midst of a dense, savage, and bigoted population, while the genial climate and thinly-peopled tracts of Australia have failed to excite the enterprise of discovery, when to all appearance it would be attended with so many more prospects of success and utility.

To those who have been accustomed to traverse the vast spaces of continental America, the undertaking of crossing Australia in various directions would appear a matter of no great magnitude or difficulty if furnished with the hardy horses and mules and the well-trained muleteers of Spanish America.

But travelling with success and safety over great spaces in wild and savage countries is an art which can only be acquired by considerable practice; and the British travellers in Spanish America must often have remarked the insufficiency or uselessness of European servants in their journeys, while the natives, trained to travel, seemed prepared for every contingency.

In contemplating the causes which may have prevented or damped the spirit of discovery in Australia, the most important one appears to be the want of points of *appui* for rest and refitment, or for succour when the journey is accomplished. The traveller must have some haven in view to which to direct his steps, and where, at the end of his toils, he can expect safety and repose; but if this haven be the one he started from, then his resources and toils will but procure half of the discovery which might have been obtained by proceeding to a different terminus.

Settlements and points of succour are now becoming numerous on the coast, but in a continent like Australia, without inlets of the sea and great navigable rivers, it must be manifest that no considerable progress can be made in a general knowledge of the interior, until some permanent posts are there established to which the traveller can direct his steps, either by design or in case of need: the number of such posts need only be three, at or near

the points marked *a*, *b*, and *c*, on the accompanying map, and as a measure of facility, the post marked *a* might be furnished by the governor of the Swan River settlement, the post *b* by the governor of South Australia, and the post *c* by the governor of New South Wales.

These three posts established, it will be seen, from the imaginary routes traced on the map between them and some nine points on the sea-coast, that the face of this continent may be very generally ascertained and traversed in many directions from sea to sea without subjecting travellers to any greater journey than one of about 500 miles without coming to a place of rest and succour; nor must it be considered that the establishment of such inland posts with a small garrison would be so much expense incurred for pure motives of curiosity, since much advantage must result to the settlements on the coast from a knowledge of the natural resources of the interior, from knowing and bridling the numbers and power of the natives. Such posts and garrisons would also prove useful in checking the movements of roving Europeans disposed to lead a life of plunder and aggression, as has so unfortunately happened in Diemen's Land.

The establishment of three posts in the central portion of Australia may appear at first sight a measure attended with difficulties; but it is to be considered that the country is generally free from thickets and dense forests, that on the contrary it is essentially open and transitable, not only for foot and horsemen, but also for carriages, so that the transport of a small body of armed men in a fine climate, for a distance of 500 miles, with a supply of provisions, could not, in any degree of probability, be an enterprise either of difficulty or danger. The servants of the North West Company, in a rigorous climate, would not estimate such an undertaking highly, neither would it be so deemed in many other parts of America.

Thirty soldiers, with a portion of settlers, might readily maintain themselves in provisions by means of an original stock of cattle, sheep, and swine, in a country so peculiarly pastoral, and might, moreover, in a short time have a superabundance for barter and profit; and where horses are so soon likely to abound, the making communications with head-quarters could be effected (when required) in a space of ten days or so, in favourable seasons of the year. The only precaution necessary to be taken would be the selection of a good site for the post, and route to it, by means of a previous exploring party.

Attention of late has been much turned to preserve the indigenous population from injuries by the colonists, and to draw them gently into social and civilised habits; and if the person in charge of such a post was a man of judgment, he might, with the assistance of a missionary, be mainly instrumental in forwarding

these objects. On the whole, I can view the establishment of such inland posts in no other light than a duty to all interests,—to the government, the colonists, the natives, and the acquisition of geographical knowledge. Nor do I see how any considerable progress is ever to be made in inland discovery without such means. Are we to wait till population gradually extends from the shore to the centre? or till some rival nation, establishing a colony on the shore, shall push on discoveries in the interior? All difficulty and delay would in that case speedily vanish, and we would yield to pride, if to no other inducement, in the performance of a duty which science, no less than policy, demands of that nation to whose guidance the destinies of Australia are committed.

In relation to the early history and migrations, not only of the human, but also of the brute races, the geography of Australia exhibits some strange anomalies, which are the more interesting and deserving of study in proportion to the difficulty of their explanation.

Of all continental land, Australia (as far as it is known) presents man the most scantily disseminated, in the lowest state of civilization and knowledge, and the most abject in the means of bodily comfort or enjoyment, the most deficient of all history or tradition, and with the fewest monuments of past times; circumstances directly contrary to all *à priori* deductions from the geographical position and physical condition of the country, which—enjoying a most favoured climate, both for the rapid increase of the human race and the development of its best powers, and immediately connected by numerous islands with China on the one hand, and India on the other, the most anciently populous and civilised of nations—would well have warranted the conclusion of an ancient numerous and civilised people, in possession of all the knowledge and arts which India and China could supply; and if, through the accident of time, the present race had sunk into barbarism, that we should still find the monuments of former prosperity and past ages, marking the ruin of empires and revolutions of nations. But as far as the most recent researches permit us to speak, there is no indication during the space of four thousand years, or since the origin of the human race, that colonies had been established in Australia by any civilised nation until the present epoch; whereas Java, at little greater distance from Australia than England is from Spain, appears to have been early populated and civilised, as so emphatically shown by the following statements of Sir Stamford Raffles respecting that island:—"The numerous and interesting remains of former art and grandeur which exist in the ruins of temples and other edifices, the abundant treasures of sculpture and statuary with which some parts of the island are covered, give evidence of a former state of religious

belief and national improvement, which are represented in images, devices, and inscriptions." And again—"The grandeur of their ancestors sounds like a fable in the mouth of the present degenerate Javan; and it is only when it can be traced in monuments which cannot be falsified, that we are led to give credit to their traditions concerning it."

Of such easy access to the maritime nations of South Asia, and in the vicinity of a country so anciently peopled and civilised as Java appears to have been, it can hardly be ascribed to accident that Australia should have remained during the great flood of time unvisited and uncolonised; that, amidst the pursuit of conquest and discoveries by some nations, and flight from oppression by others, Australia should have continued unreclaimed from the state of nature, a sealed and secluded land to the migrations of man, so much nearer to the presumed cradle of his race, while the far distant countries of Peru and Mexico offer proofs of ancient and civilised nations.

The inference would seem to be, that in former times some physical difficulties or conditions existed, which do not now exist, which placed a barrier to the colonization of this continent, or else that some convulsions of nature destroyed in this division of the globe both the race and the works of man. These are, however, inferences which we cannot venture to adopt until the progress of inland discovery be farther advanced, for we are still allowed to expect in the interior traces and proofs of the ancient dominion of civilised nations.

But, on the other hand, the absence of most of the larger quadrupeds of Asia, and the possession of a few peculiar to itself, rather confirms the presumption of the long seclusion of Australia from the rest of the world.

Some have supposed that Australia is a more recently formed land than the other continents, but if even such a notion was admitted for the sake of argument, it could only hold good in respect to mineral composition, while in respect to the epoch of man, there are sufficient geological proofs of an equal antiquity with the other divisions of the globe.

The curious problem of the long-secluded state of Australia from the rest of the world, while apparently so easy of access, must remain for the present matter of conjecture, though we may justly entertain the hope that the progress of inland discovery will throw considerable light on the subject. We shall learn the present physical state of the country, and also a probable knowledge of what that state has been during the last four thousand years. We shall learn in what state the indigenes of the interior remain—their languages, customs, and manners—what connexion may be traced between them and the tribes of other

countries—and whether there exist any remains of a more ancient and more enlightened people.

But while we remain in want of more decided facts on which to ground deductions, too great care cannot be taken to preserve the vocabularies of the various tribes, their manners, customs, and rites, and the names of places, which, in other countries, are sometimes significant in languages no longer spoken on the spot.

Much credit seems due to Mr. Scott Nind for his attention to the above subjects, as exemplified in a paper communicated to the Geographical Society,* in which he describes a law of the natives near King George's Sound, of so extraordinary a character, and yet so similar to one adopted by some tribes of British Guayana, as may well justify the temptation of placing the two accounts together in this place for the purpose of showing the value of such researches.

"The whole body of the natives," says Mr. Nind, "are divided into two classes, *Erniung* and *Tem*, or *Taaman*; and the chief regulation is, that these classes must intermarry, that is, an *Erniung* with a *Taaman*: those who infringe this rule are called *Turedangers*, and are subject to severe punishment. The children always follow the denomination of the mother—thus, the man who is *Erniung*, will have all his children *Taaman*, his sister's children will be *Erniung*. This practice is common to all tribes in the neighbourhood, with the exception of the *Murram*."

"The Arrawack [Arahuac] tribe of Indians, in Guayana," says Mr. Hillhouse,† "consists of twenty-seven families. The cast of blood is derived from the mother, and the family genealogy is preserved with the greatest care, as a preservation from incestuous intercourse, one family (clan) not being allowed to intermarry within itself. The children of a *Maratakayu* father cannot therefore be *Maratakayu*; but if the mother be *Queyurunto*, the children are also *Queyurunto*, and can marry into the father's family, but not into the mother's."

It does not appear probable that a law so extraordinary, but so well devised for the regulation of marriages, could have been adopted accidentally by savage nations, so far apart, and in opposition to the general habits, the want of restraint, and hasty passions of man, in a barbarous state of existence, and we might therefore infer that this institution has been derived by each of these tribes from some people in a more advanced stage of knowledge than themselves; and if at any time we shall be able to trace this custom to its source, and observe its greater extension, these circumstances may tend much to elucidate the migrations and connexions of the early families of man.

* Journal, vol. i. p. 37.

† Ibid. vol. ii. p. 228.

XII.—*Descriptive Sketch of the Islands and Coast situated at the Entrance of the Persian Gulf.* By Lieutenant WHITELOCK, Indian Navy. Communicated by the Bombay Geographical Society.

[As the chart of the Persian Gulf, resulting from a trigonometrical survey by the Officers of the Indian Navy, between the years 1821 and 1829, has now been published for some years, and has been made use of in all good modern maps of that region, it has not been thought necessary to reprint the portion of it here referred to.

This descriptive sketch will be found to be a useful supplement to a Memoir by Lieut. Kempthorne, of the Indian Navy, in vol. v. p. 263 of the Geographical Journal; and here, perhaps, it may be permitted to regret that—although this important survey of the Persian Gulf has been finished more than eight years—no complete account of it, nor any description of the coasts, has yet been published.—Ed.]

PASSING two rocky islets on the Arabian shore, which are called the Quoins, you enter the Gulf of Persia, and there are few parts within it which present a higher claim to attention than this, for the whole region on every side abounds in historical and classic interest.

On the right hand, beneath a lofty mountain, called by the Arabs Jebal Shamál,* which is seen towering far above the other hills on the Persian shore, with its summit clad with snow, even in the spring-season, lies the far-famed island of Hormuz; on the other hand Lárek;† and only a few miles further on, the town of Gamrún, which in opulence and magnificence was only inferior to Hormuz. Kishm,‡ also, the ancient Oaracta, and Mínáú, near which took place the meeting of Alexander and Nearchus, are situated in this vicinity.

The former renown of the island of Hormuz has often occupied the descriptions of earlier travellers. My object in this sketch is to describe the island as it is at present; and this, when considered with reference to its former opulence and splendour, may not be deemed wholly uninteresting. Hormuz is twelve miles in circumference. Its form is nearly circular, and its appearance from seaward is broken and rugged. The surface, entirely denuded of soil, exhibits the various tints of its singular stratification—which, with the conical shape and isolated position of the numerous small hills composing the island, gives the former a highly volcanic aspect, and would induce us to attribute the origin of the island itself to the same agency.

* Mount North. The orthography of the names of places has been reduced to the standard adopted by the Society—(see vol. vii. p. 245).

† Or Lárij.

‡ Sometimes Kishm and Jism—(Niebuhr, Besch. von Arabien, p. 328). It seems to have been anciently called Keis or Keish—(see Jihán-numá, pp. 275, 532). It is also called Jezirah jawilah, or Jezirah Dirás, i. e. Long Island.—(Niebuhr, l. c.)

With a pilot, Hormuz may be approached from either hand without apprehension. The harbour, situated on the N.E. side, is both secure and convenient. To this, and to its insular and otherwise advantageous position, must be attributed its former importance.

The fort, in lat. $27^{\circ} 6' N.$, long. $56^{\circ} 29' E.$, is situated about 300 yards from the beach, on a projecting point of land, which is separated from the body of the island by a moat. The position is remarkably well chosen; and the whole, with the exception of the ordnance, which has been destroyed by time and rust, is still in good condition.

A few hundred yards from this, now tottering in ruins, stands the lighthouse, which must formerly have been a fine building: its spiral staircase still exists, but it would be dangerous to ascend it. A level plain extends for some distance to the N.E. of this building, having its surface scattered over with mounds and ruins of former habitations. Several tanks and wells have also been sunk here: the former, though now out of repair, are covered over with an arched roof; they are about fifteen yards in length, and seven or eight in breadth. As there are no fresh-water springs on the island, the inhabitants are wholly dependent on the supplies which are collected in these reservoirs during the rainy season.

Across this plain, towards the rugged hills which line the eastern shore of the island, a singular phenomenon presents itself, which strikingly resembles the "Mer de Glace." The hills, for a considerable distance from their bases, are covered with an incrustation of salt, which in some places has the transparency of ice; in others its surface is partially covered with a thin layer of a dusky red-coloured earth, receiving its tinge from oxide of iron, with which the whole surface of the island is deeply impregnated.

As we ascended the ridge, our progress was continually impeded by deep pits, on the sides of which the saline crystallizations have assumed a stalactitic form. From the summit you obtain a noble view of the whole of the lower parts of the Gulf: the Quoins, Cape Musandam (Rás Maskat*), Lárek, and the island of Kishm, are all distinctly seen.

The Imám of Maskat has possession of Hormuz at present: he farms it from the King of Persia, and retains in the fort a garrison of 100 men, commanded by an officer, who is styled Shaikh. A small sum is collected on account of the salt, which is exported in large quantities, and conveyed to different parts in the Gulf.

* Also spelt Maskat-Jihán-numá, p. 496.

When the island was surveyed in 1827, the number of inhabitants, who had no other employment than that of collecting this salt and fishing, was estimated at 300.

A few fowls and some sheep, brought from the main, may be obtained here, but no other supplies; nor is its port at any time visited by vessels for other purposes than to obtain salt, or for shelter during the prevalence of the westerly winds.

Such are the few remains that are left to denote the former opulence of Hormuz. The wretched habitations of its present occupants, and the dreary and barren aspect of the surrounding hills destitute of vegetation, would not lead us to recognise this spot as a fitting site for a city which contained 4000 houses and 40,000 inhabitants, whither merchants from every quarter of the globe resorted, outvying each other in the display of wealth and luxury.

The kingdom of Hormuz, or Hormuzeïn,* situated on the adjacent main, gave its name to this island, which, according to some authors, was previously called Jerún.† It is impossible to ascertain at what period this island was first occupied, but there are various authorities to prove that it has often served the inhabitants from the main as a retreat, when suffering either from civil commotions or foreign invasion. The advantages of its harbour, joined to its insular position, converted it from a barren rock, to which Nature has denied even water, into the emporium of the East.

Nearly opposite Hormuz, on the Persian shore, the river of Mínaú‡ enters the sea, in lat. 27° 7' 48" N., long. 56° 49' E. Following the course of this stream, which is very tortuous, we reached the town of Sháh-Bander,§ which stands on the bank, at a distance of fourteen miles from the sea by the winding of the stream, but only eight in a direct line.

To this point, which forms the extreme limit which the tide reaches, the river is navigable at high water for vessels of twenty tons; its average width being 100 yards, and its general depth about six or seven feet. At low tide, its bed is laid almost entirely bare, and it then has the appearance of a foul, muddy creek.

There is a custom-house, besides a few other houses, at Sháh-Bander, as boats either receive or land their cargoes there, which are conveyed by land carriage to and from Mínaú. Leaving Sháh-Bander, and after proceeding for about two hours over a fertile plain, we reached a small town named Hájíábád.|| Here we put up in a small house, which had been prepared for our reception by the Shaikh; but, although situated in the most

* The two Hormuzes (Hormisdases).

† Sir W. Ouseley's *Travels*, i. 156.

‡ Or Mínaú.

§ King's Port.

|| Pilgrim's Abode.

respectable part of the town, it had more the appearance of a store-room for grain than a human habitation, and we found the heat very oppressive, notwithstanding it was at a cool period of the year.

From the appearance of the houses, and the state of the *bázárs*, I do not conceive that this town either possesses wealth, or is of any commercial importance. The number of its inhabitants may be estimated at 600 or 700, and they are principally engaged in agricultural pursuits. Bullocks, sheep, and goats, are very numerous; and when a dearth occurs on the island of *Kishm* a great number are sent over there.

The fort of *Mínáú*, distant about a mile from the town, is situated on elevated ground on the southern bank of the river, which winds round its base. It is of a quadrangular form, flanked by round towers at the corners, in which there are a few old guns, bearing inscriptions in Portuguese and Dutch.

A draw-bridge, thrown across a moat, leads to a gate thickly studded with iron knobs and spikes on the south-western side.

The walls are strong, and the fort is generally in good condition. The garrison consists of about 100 men, well appointed, who are obliged to be constantly on the alert, in consequence of the numerous marauding bands who rob and plunder the country. The fort, however, is commanded by a hill on the N.E. side; but, in a country where the use of artillery is nearly unknown, this is of little consequence.

The river at this point is little more than a mountain stream: its width is about 130 yards, and the water is clear and deep. It takes its rise from the mountain called *Jebal Shamál*, distant about thirty miles. Notwithstanding its present insignificance, when the snow melts on the hills, or heavy rain falls, it swells into a large and rapid stream.

In some parts, where the river is fordable, I observed its bed to be composed of coarse gravel, with small pebbles of primitive rocks, which have been brought during the floods from the surrounding mountains. The steep banks near the sea exhibit a succession of alluvial deposits. The district comprehended between the fort and the sea bears the general name of *Mínáú*; and to the river it owes a great portion of its fertility. Numerous artificial rills conduct the water over the face of the country, and afford near the banks a constant supply; but in tracts more remote the grounds are irrigated from wells. The water is drawn up by bullocks, either by the mote, as practised in India, or, when the wells are sufficiently shallow, it is raised by the lever, as on the banks of the Nile and Euphrates.

The soil is of a rich alluvial nature, and yields, with little labour to the husbandman, a plentiful crop. From its loose

nature it requires but little ploughing, and the instrument used is rude and simple. From Sháh-Bander to Hájíábád, the whole of the country is cultivated, yielding large crops of wheat, fruit, and vegetables. Melons are common, and onions are raised in large quantities; plums, cherries, frequently fine apples, and dried fruits, are brought from the interior. The Indigo plant is also cultivated here to a considerable extent.

Although the site of the town is low and badly chosen, yet it does not, excepting at the close of the date season, appear to be considered unhealthy; but near the fort the air is said to be very salubrious. During the hot months many of the better classes from Bander-'Abbás* and Kishm resort hither, when, in addition to its superior climate, they enjoy the luxury which its light and pure water affords, which can only be duly appreciated in such a country.

In the better parts of the town of Mínaú the houses are constructed of rough stone, cemented together with mud. In the windows talc is substituted for glass. A small open space, serving for their cattle and for various domestic purposes, is sometimes enclosed by a wall, but more generally a fence, constructed with branches of the date-palm. With the same material, the lower classes construct their huts, which are afterwards covered over with a layer of mud.

We found the inhabitants civil and obliging, but very anxious to cheat us on every opportunity. I believe this feeling, which is common in other places along the Gulf, arises from an idea that we are ignorant of prices, or indifferent to the value of money. Some individual usually attaches himself to a stranger, reserving to himself the exclusive right of taking advantage of him. They are shrewd and intelligent, and this compensates in some degree for their extortion, as they possess considerable information, which they are very willing to impart, and are very useful to a visitor when walking abroad, by keeping off the crowd, or as messengers.

Gamrún, or, as it is now styled, Bander-'Abbás, appears to have been a town of little importance until 1622, when Sháh 'Abbás, assisted by the English, drove the Portuguese from the island of Hormuz, and transferred its commerce to this port. Here, instead of being carried in ships to Basrah and the northern ports of the Gulf, a very considerable portion of the imports from India and Africa were landed, and transported by means of caravans to the interior parts of Persia and the adjacent countries; so that Gamrún became for a time the emporium of Persia.

The English, Dutch, and French had factories here. Merchants from all parts resorted to it, and it seemed destined to

* 'Abbás's Port—more correctly, Bander-'Abbásí.

attain the former opulence and splendour of Hormuz; but its commercial career was far more brief. Towards the close of the seventeenth century, the internal commotions and distracted state of Persia frequently interrupted the route for very long periods, and the current of the trade became diverted to the northern ports. It should still, however, be remembered, that this route conducts by one of the natural passes into the heart of Persia; for when Bushire,* a few years ago, remained for some time in a disturbed state, commerce found its way again into this channel; and, if Bushire had not been speedily restored to peace, Bander-'Abbás would very soon have recovered a considerable portion of its former importance.

Even at present the trade is not inconsiderable, and it is said to be still increasing. In 1827 the Imám of Maskat, to whom the port at present belongs, collected a revenue of from eight to ten thousand dollars.

Persian carpets, tobacco, and dried fruits, form its exports; and piece goods, Indian cloths, and China-ware, constitute its principal imports. The annual importation of these articles at the same time was estimated at nearly three lakhs of rupees.

The town is situated on a slope, which approaches close to the sea; the houses are few, and wretchedly constructed, and the people are mostly lodged in huts. They are a mixed population, composed of Persians, Arabs, Kurds, a few Armenians, and Bedowins. Their number, though constantly fluctuating, may be estimated at from four to five thousand. Some portions of the English factory-house are still standing; but that erected by the Dutch is in better repair, and still serves his highness the Imám of Maskat as a residence during his visits to the port.

The tombs of the former European inhabitants are just without the town. In their vicinity there are some tanks, which were excavated with extraordinary labour by the Portuguese; the length of the most extensive cannot be less than half a mile. These are intersected at right angles towards the extremity by two others, so that they assume the shape of a cross.

Between Gamrún and Linjah† there is little on the sea-coast of Persia to attract attention. The range of mountains extending from Jebal Shamál, which is distant thirty miles from the sea, gradually approaches the shore towards the latter port, where they are not more than three miles distant. The maritime plain throughout the whole distance is low and barren, though not without occasional spots of cultivated ground. Abreast of Laft, the coast is fronted by swamps, thickly covered with mangrove thickets, and within this, close to the margin of the sea, stands the small village of Khamír. In this vicinity there are mines of sulphur, which

* Properly Abú-Shehr (Father Town).

† Or Lunjah and Lung. Nieb. p. 333.

are extensively worked, and the produce imported in large quantities to Maskat. Between Khamír and Linjah there are two small towns, one called Bandar Hallam, containing about three hundred inhabitants, who trade in salt; the other Kung, where the Portuguese had formerly a small factory established, principally with a view to command the copper-mines in its vicinity, which were worked by them.

Abreast of Básidóh* the height of the coast range was ascertained, by trigonometrical measurement, to be 3498 feet above the level of the sea. Although the ascent is very laborious and difficult, it has been accomplished by several of our officers. Crossing over the maritime plain, which is here not more than three miles and a half in breadth, they found at the foot of the hills a mineral spring, the waters of which are highly beneficial for cutaneous eruptions, as well as rheumatism, scurvy, &c.

Of the islands which, besides Hormuz, form the group situated in this part of the Gulf of Persia, that of Kishm is the largest, and indeed surpasses in size all the islands of this inland sea. Kishm stretches along the Persian shore, from which it is separated by a channel thirteen miles in (maximum) width, but contracting in the middle of its length to three. The channel is studded with islets, and bears in the new charts the designation of Clarence's Straits.

In its form, Kishm bears a striking resemblance to a fish, the town of the same name being situated at its head, which faces the eastward; Laft and the island of Anjár† to the northward and southward of either fin; and Básidóh to the westward, at the extremity of its tail. Its length is fifty-four miles, and its width, at the broadest part, twenty miles. On the southern side, a ridge of hills extends from one extremity to the other, while the remaining space to the northward is occupied by arid plains and deep ravines. The greater part of the surface of the island is sterile, and in some places incrustated with a saline efflorescence; but the most striking features in its structure are some singular-shaped table-hills, which occupy insulated positions in the plains. These are of a circular form, principally composed of sandstone, and are broader at the upper part than at the base. Their average height is from two hundred to four hundred feet: their surface and sides, worn into hollows by the weather, give them the appearance of having been subjected to the action of a powerful stream, an illusion still further increased by observing the plains and the sides of the hills, which, in the form of banks, bound what seem to be the beds of deserted water-courses. In a coun-

* Or Básidó, as Niebuhr spells it (p. 329), is probably a corruption of the Portuguese Baxador for Embaxador.

† Hinjám. Niebuhr, p. 328. "The English," he says, "call it Angar." No doubt the Persians say Angár, and the Arabs Anjár.

try where earthquakes are frequent, we might infer, from the general appearance of the whole, that these isolated masses denote the original level of the island, and that the plains have sunk in every direction around them.

At Básidóh, in March, 1829, for six hours during the night, successive shocks were felt. The inhabitants were in great alarm, and even the cattle evinced symptoms of fear; nothing serious, however, occurred.

The northern part of the island is the most fertile, and on this account the most populous. The soil consists of a black loam, and on it is reared wheat, barley, vegetables, melons, grapes, &c. : dates are produced in large quantities : cattle and poultry are also reared; but, unless their crops fail them, the inhabitants are indifferent about disposing of the former. The whole number of inhabitants on the island may amount to about five thousand. They employ themselves in fishing, in cultivating the soil, and in making cloth. They reside in villages and hamlets scattered along the sea-coast.

The only towns on the island are Kishm (the largest), Laft (next in importance), and Básidóh.

Kishm. The town of this name is situated near the sea at the eastern point of the island, its site being remarkably well chosen. A wall flanked by turrets surrounds it, and affords the inhabitants security from robbers or pirates. Some of the houses are large, and, for this country, neatly fitted up; the roofs are flat, and the apertures for light are partially filled with curious devices formed of a fine cement.

Kishm has the appearance of having been formerly of greater commercial importance than it is at present. Even when I first visited it, in 1821, the bázár was abundantly supplied with vegetables of various kinds, fruits, apples, and pomegranates from the interior of Persia. Very good wine and every description of dried fruit could be then obtained, as well as silk and cotton cloths; together with very fine carpets soft as silk, and of the richest pattern and dye. These latter we purchased at the rate of twenty dollars each; they were six or seven feet long, by three feet broad. At this time, the British force was encamped near the town, and the demand was in consequence considerably increased; yet the supply was in general fully equal to it.

Kishm is frequently visited by native vessels, which touch here for wood and water, or to engage pilots for the Kishm channel, and the town has, in consequence, a bustling appearance. A few bagalahs * are constructed here with timber brought from the Malabar coast.

* Coasting-vessels.

Captain Brucks computes the number of inhabitants at two thousand. In the plains to the westward of the town there are several patches of cultivated ground, interspersed with clumps of date-trees. Our force encamped about one mile from the town, in a strong position, on an elevated tabular ridge, which presents a steep face on either side. The situation was found to be so hot and unhealthy, that, after losing several men from fevers, they were obliged to quit it.

Laft, when in the possession of the Juwásimí* pirates, was a place of considerable strength, to which they resorted, and the tortuous nature of the channel and numerous shoals (then unknown) in Clarence's Straits rendered it very difficult to follow them. During the expedition under Colonel Smith and Captain Wainwright in 1809, these Arabs beat back, with considerable loss, a storming party, but surrendered when the vessels came close in, and had battered their walls. The town is at present in a miserable state, built on the slope of a hill on the northern side of the island and surrounded by a wall.

Básidóh, in latitude $26^{\circ} 39'$ N. and longitude $55^{\circ} 22'$ E., at the western extremity of the island, was formerly in the possession of the Portuguese, and the ruins of the town and fort which they erected may be still traced. This station has been happily selected; for the British, after various attempts to fix on other spots, were compelled to abandon all, and finally to settle here; and, after similar attempts to establish a rendezvous at other ports, the naval squadron became also finally stationed here.

On account of its salubrity, and the local advantages it enjoys, this is the most eligible spot which could have been chosen in the lower part of the Gulf. An hospital and storehouse, a guard-room, cooperage, &c., have been erected at the public expense. Five or six private houses, a billiard-room and five-court, erected by subscription by officers of the Indian navy, were soon afterwards raised, and a very respectable bázár was subsequently established.

The few vessels now stationed in the Gulf, from being constantly employed in various parts of it, visit Básidóh less frequently than formerly, and the place is in consequence going to decay.

The bázár affords some scanty supplies from Mínáú and Linjah; a few merchants, who emigrated hither from Bushire when the place was more flourishing, still remain. They contrive to increase their income by hiring out jaded horses and asses to our seamen. Some Indian washermen derive a more

* Jawáthimí, or Jawásimí, i. e., belonging to the Jawáim or Jasúms, the aboriginal natives of the country.

certain profit; for within the Gulf, with the exception of Bushire, this is the only place where clothes can be washed well. Some Jews also reside here; they are principally goldsmiths, and occupy themselves in making rings and bangles for the females.

Básidóh is scantily supplied with water. The wells dry up in April or May; and the few tanks, which are similar in construction to those of Hormuz, and have, it is supposed, the same origin, although kept in repair by the English, do not afford more than is sufficient for the station, and the ships fill up either on the opposite coast, or further up the channel.

Although nothing can exceed in barrenness the appearance of the country in the vicinity of Básidóh, yet there are several places, only a few miles distant from it, which often exhibit all the verdure of more fertile regions; such are the plains contiguous to Góri and those near Dastagán. The former cover a space of eight miles in length, and three in width, and contain groves of the date-palm, verdant plots of cultivated ground, and, after the rains, a luxuriant crop of high grass.

The few productions of this island do not differ from those to be found on the main: a few grapes are grown in wells, or the vines are permitted to climb around the branches of the banian (*ficus indica*); a few mangoe-trees are also found at Dastagán, but in no other part of the island. Salt is found on the southern side, rising up into hills, or formed into caves. In the centre of one of these caverns, about fifty yards in length, and twelve in height, flows a stream of water; and from the roof and sides hang stalactites of salt, which are sometimes eighteen or twenty inches in length. The surrounding plains are covered with a saline crust, which the natives collect and convey to Dastagán. Towards the centre of the island there is an insulated rock about three hundred feet in height, which is steep on every side, and seems to have formerly served the purpose of a retreat to some bands of pirates or robbers. The summit can only be gained by climbing up through a narrow aperture resembling a chimney. Some of our officers, who ascended by this way, found at the top the ruins of several houses and two tanks.

The natives have a tradition, that this singular spot was formerly taken possession of by the crew of a Portuguese ship wrecked on the island, who for a long time resisted the attempts of the inhabitants to destroy them.

Sandstone appears the predominant rock on the island. On many of the arid plains in the centre of Kishm are found fragments of mica, varying in size from three or four inches to even a foot square.

Good hunting is obtained in several parts, and a small and very beautiful description of antelope is found during the day on

the plains. At night they retreat to the hills. They are very shy, and, in order to give the greyhounds any chance of success, a party must be stationed to turn them from the hills, for which they invariably make upon the slightest alarm. They are sometimes taken after a run of two or three miles, completely tired, and unable to proceed further; but they more generally escape. I have known them in the former case to be taken alive and unhurt, the dog standing over the poor animal, but unable from fatigue to harm it. Their flesh in the cold weather is much esteemed, but in the hot season it is lean and tasteless. Hares and small rabbits are also found on this island. Jackalls and foxes afford occasionally a good chase, but, as they are favoured by the country, they more frequently take to earth. Camels and asses are employed as beasts of burthen: in the rutting season the former are very savage.

The principal birds are vultures, cranes, grey partridges, hawks, pigeons, the kingfisher, houppoe,* and jay. There are several others remarkable for the beauty of their plumage. Several varieties of fish are caught on Básidóh bank: prawns, lobsters, and large crabs are also abundant. There are several varieties of snakes; some of the most venomous kind. I have seen death follow in two hours after the person had been bitten.

From the irregular outline of the island, and the existence of numerous banks and islets, the direction of the channel which separates Kishm from the main is varied and tortuous.

Commencing from the westward, about midchannel between Básidóh and the main, there is a sandbank with about ten feet water on it. Across this, towards the Persian coast, you carry a depth of two or three fathoms; but towards the Kishm side the channel varies both in its nature and depth. In some places you have soft mud over hard rocks, in others a mixture of clay and mud very tenacious, and in other parts a clear bottom of sand. Proceeding up the channel towards Gorún† the deepest water is near the island, and its depth is indicated by the appearance of the shore; if the cliffs rise up boldly from the beach, the water is deep close to the shore: on the other hand, where the plain slopes down to the sea, extensive mud flats run off it to a considerable distance. Beyond Gorún, approaching towards Laft, two channels branch forth; one near the Persian shore used by ships, and another, although more narrow and winding, preferred by boats, on account of its being free from rocks or banks: the space included between these two channels is nearly blocked up with mud flats dry at low, and but partially covered at high water. Narrow streams intersect these flats, and form them into groups

* Upupa.

† Garún for Jarún (?).

of islets. These islets are covered with a dense thicket of mangrove-trees; and the lively green of their foliage, in a country so destitute of vegetation, presents a refreshing and pleasing effect.

During our stay amidst these islets we were apprehensive, from the close nature of the woods, and the thick fogs which we observed hovering over them, particularly after sunset, that severe sickness would have prevailed amongst us; but, notwithstanding that we were three weeks engaged in surveying this part of the channel, suffering much, though in the winter season, from exposure and fatigue, we had not a single case of fever.

Beyond Laft the forest disappears, but for about sixteen miles the channel continues equally intricate: from this point it runs along the Kishm shore, and eventually opens out into the Gulf of Hormuz, where all is clear.

There is a point of some interest connected with the set and direction of the tide in this channel; the flood enters at both extremities of the channel, and meets at Laft, where the rise and fall is about fourteen feet. This affords great facility in navigating the straits; for a vessel quitting the town of Kishm with the first of the flood may reach, and start from Laft at high water, and have the whole of the ebb tide to carry her to Bâsidôh.

The Island of Anjâr is situated on the south side of Kishm, opposite to the town of Laft, which stands on the northern shore. This island was formerly inhabited, but since the destruction of the town by the pirates, it has been deserted. Vessels occasionally seek shelter here from north-westers. Water also can be procured from wells and reservoirs situated near the anchorage.

A ruined mosque, which stands near the site of the former town, is still conspicuous. We found its geographical position to be, latitude $26^{\circ} 41' N.$, longitude $55^{\circ} 56' E.$

This island is formed of bare rocks, and has the volcanic appearance which is commonly observed in the other islands of this Gulf.

About twenty-four miles to the south of Bâsidôh there are two uninhabited islands, called the Great and Little Tomb.* The former is well stocked with antelopes, and much resorted to by the officers stationed at Bâsidôh, for the purpose of hunting. In the winter months the island is well covered with grass, and the water is very good.

Lârek is the last island to be mentioned. It lies in latitude $26^{\circ} 53' N.$, longitude $56^{\circ} 23' E.$ It is of a volcanic character, and in size, as well as in the colouring of its strata, is very similar to Dâlmah,† one of the islands near the Arabian coast, called by us Maud's Group.

* Tunb and Tunb Nâmiyâh. Niebuhr, p. 328. Nâmiyâh or Nâmiyâh is a corruption of some European or Hindî word.

† Dâlimah or Zâlimah, 'dark.'

A rocky ledge, extending to the average width of half a mile, surrounds Lárek; beyond that the water suddenly deepens over a bottom of rocks and sand to eighteen or twenty fathoms. The island has neither harbour nor any secure anchorage near it, so that, from whatever quarter the wind may blow, the sea rises and breaks with much fury over the rocks which gird its shore. It is therefore highly dangerous to land in unsettled weather, and for these reasons Lárek is rarely visited.

We found it inhabited by a few fishermen, who, to the number of about 100, reside in wretched huts, within the walls of an extensive fort. They live together as one family, and are a poor and insulated race, bearing some resemblance to the tribe (to be described hereafter) who reside in the vicinity of Rás Musandam, with whom, and in this they are singular, they maintain a friendly intercourse. They have a great aversion to mixing with their neighbours, and rarely ever visit the town of Kishm, though only six miles distant.

They subsist on fish and dates. No part of the island is cultivated, and the few cattle they rear, for the sake of their milk, partake in general of the same food as their masters.

I shall now conclude this sketch with a brief description of the land about Rás Musandam, and of the inhabitants who are found residing on the shores of the deep inlets and coves in its vicinity.

Rás Musandam lies in latitude $26^{\circ} 23' N.$, and longitude $56^{\circ} 35' E.$ It forms the outer point of an island bearing the same appellation, but the true promontory of the coast is called Rás Gabr Hindí,* or Rás el Jebal.† From this the island is separated by a deep and narrow channel.

The Cape is about 200 feet in height, and rises abruptly from the sea. It is composed principally of basalt, which gives it a black and gloomy aspect.

On both sides of this promontory the coast line is indented in a most singular manner into deep coves and inlets, extending as far as Rás Sheikh Mas'úd on the western side, and to Rás Haffár to the southward. The two most remarkable of these inlets are named in the new charts after Mr. Elphinstone and Sir J. Malcolm: the former inlet lies on the western side, and runs in a most tortuous course for nearly eight miles. At the bottom it is separated from Malcolm's inlet, which lies on the opposite side of the promontory, by a mountain ridge which is 500 feet high, and difficult to ascend, but only 100 yards broad at the summit.

The depth of water in the coves varies from thirty to forty

* If rightly spelt, this name signifies Cape Hindú Párf or Gabr.

† Cape Mount.

fathoms in the centre, shelving towards the rocks on either side over a bed of branching coral and fine sand. The water is exceedingly clear, and the various kinds of rock-fish may be seen sporting amongst the coral in eight and ten fathoms' depth close to the shore.

At the entrance, and inside the coves, there are several curious rocky islets; some of them with deep water close to their base.

The hills, in general, rise perpendicularly from the sea, and average in height from 200 to 800 feet; they are extremely rugged and barren, and in some places deep caverns have been formed at their base by the action of the waves. They are principally composed of basalt and granite, in a state of decomposition, which renders it dangerous to ascend in many places, as, by the slightest pressure, large masses of rock are detached. Quartz is met with very commonly, and likewise slate-stone. Some stunted shrubs and grass grow on the side of the hills, and likewise the senna plant.

Khasáb* bay (the fort in latitude 26° 13' N., longitude 56° 20' E.) is the only one of these inlets in the vicinity which differs sufficiently from the others to merit a separate notice. Nature appears less forbidding in this spot, for at the bottom of the bay there is a plain of considerable extent, which is covered with a rich soil, and yields a tolerable crop of wheat, barley, and onions, besides dates; and the verdure, which is everywhere surrounded by naked rocks, produces a pleasing effect.

The fort is large, and strongly built of the usual form, with turrets at the corner; but it is considerably out of repair, and will soon fall into ruin. Good water is plentiful, and easily procured; and we obtained some cattle and other supplies from the natives.

Fish is procured in great abundance in all the coves: mullet, sir-fish, and the different kinds of rock-fish, are the most common; oysters are found attached to the cliffs, and are very good. The natives procure a beautiful large conch-shell from a great depth, and eat its fish when cooked.

The isolated condition of the inhabitants of these hills and coves has rendered them remarkable for their primitive state of ignorance and poverty, which is, however, compensated in a great measure by their love of home, and general contentment. They are principally found residing in the little sandy bays situated at the extreme end of the inlets, living in small stone huts, and surrounded by a few palm-trees: they subsist on fish, barley, cakes, goat's milk, and dates. They are badly clothed, but their dress is not otherwise remarkable.

They profess the Mohammedan religion, and practise its laws

* Khasáb, i. e. Butcher (?). Casaab in the charts of the Persian Gulf.

as far as they understand them. They speak Arabic, a corrupt jargon certainly, and difficult to be understood even by Arabs; but I do not believe that they have a distinct language, for, when Mr. Wellsted put the question to the Imám of Maskat, he decidedly said they had not; that he had seen a few of them at Maskat, but he believed it was very seldom that they ever left their native hills, and they were a singular, but a poor and inoffensive race.

It is impossible to say what their number may be, as they shift about at different seasons, and sometimes quit their valleys and live on the summit of the hills. At a place called Limah we found them residing in natural excavations on the side of a steep hill, the front part only being partially built up with loose stones. It had a most singular appearance. The caverns were in ranges one above the other; the children were usually seen tied with cords, to prevent them tumbling down the precipice.

They are too ignorant to be even inquisitive; and when some of them were induced to come on board, idiotic surprise for a moment, and indifference immediately afterwards, formed the principal characteristic of these poor people. Watches, pictures, and looking-glasses were shown to them, which they had evidently never seen before; but the chain-cable and the pigs were the only objects that fixed their attention. Their interest in the cable arose from the following circumstance. We anchored in the first deep cove, about ten o'clock at night, in forty fathoms, and the chain in running out of the hawse certainly made a noise, which reverberated amongst the hills to such a degree that the inhabitants fled in terror with their wives and families, and could not be induced to return again, until the cause of their alarm was explained to them.

The natives are very indolent and slovenly, and never work more than is necessary for their maintenance; fishing and making nets are their only occupations. The women do the house work, and milk the goats, which ramble about the hills. We conceived at first that their goats were wild, indeed they were so to us, and afforded some good sport; however, it was explained by the natives that they were individual property, and we paid liberally for our mistake. We found the people exceedingly civil and good-natured, and they seldom allowed us to leave a village without inviting us to feed on dates and milk.

The men possess the faculty of pitching the voice to a remarkable, shrill note, which can be heard over the hills and valleys to a distance which would be considered incredible.

XIII.—*Notes upon the Comparative Geography of the Cilician and Syrian Gates.* By WILLIAM AINSWORTH, Esq. Read April 9, 1838.

THE Gulf of Iskenderûn is nearly surrounded by mountains. To the south it is bounded by Rhosus,* which attains an average elevation of 5000 feet, and terminates rather abruptly in the Jebel Kheserik and Rás el-Khanzír,† on the sea, scarcely leaving room for the passage of an army; but, if this difficulty could have been overcome, another presents itself in the Jebel Músa, a more southerly chain which advances precipitously into the sea, its south-western base bearing the ruins of Seleucia in Pieria, by the galleries of which it is cut through.

At the northern foot of Rhosus, an aqueduct of considerable length and many ruins attest the site of an ancient city, called Arsús‡ by the natives: it is probably the Rhosus of Strabo.

The chain of Rhosus extends east a little north to the parallel of Iskenderûn, where it is separated by a pass from the range of Amanus, which runs from south-west to north-east.

This pass is called the Beilán Pass. It is the only pass commonly practicable from Cilicia into Syria; and near its foot are the ruins of Pagræ,§ which, according to Strabo (lib. xvi. p. 751), overlooked the plain of Antioch, now called El 'Umk; and on the verge of which is Khán Karamúrt or Palamút Khán, a large khan occupied by Ibráhím Páshá's troops, when he carried this pass in his advance into Asia Minor. There is also in the same neighbourhood the ruined castle of a chieftain who levied tribute in the mountains. The castle is called Bedri Káfir, where, before an arch-enclosed tomb, said to contain the body of the bandit, were offerings of miniature bows and arrows. Near the summit level of the pass, but a little to the north-west of the crest, is the modern town of Beilán,|| much esteemed for its fine air and water. Its khán was built by Sultán Suleimán,

* Rhosus. See Strabo, xvi., Casaub. 751; sometimes Rhossus, but the best MSS. and coins have only *s*.

† Cape Hog.

‡ Or Ka'bah (the Cube).

§ Bakrás Kal'ah-sí (the Castle of Bakrás in M. Rousseau's map). "Baghrás" (Abúl-fedá, Tabull. Syria, p. 119), "with a lofty castle, springs, and a river; twelve miles from Antioch and as many from Iskenderûn, overlooking the valley (úm) of Herem, which lies to the east of it."

|| The town of Beilán was found, by barometrical measurement, to be 1584 feet above the Mediterranean. The Christian church (zone of quercus ægilops and Valonia oak) 2696 feet; temperature of an abundant spring in limestone 56° Fahr. (12.6 cent.); air 62; Kuriú (Wolves') Pass, 4068; summit of Beilán Mount (limestone), 5337. Jebel Kheserik, according to Capt. Beaufort, is 5550 feet above the sea; the first cone west of it, by barometer, was found to be 5216 feet, and the second cone west 5091 feet high. The lower limit of the pine forests was 2975 feet; temperature of springs 51° Fahr. (10.4 cent.); springs from diallage rocks at 4353 feet 48° Fahr. (8° 8 cent.).

and its mosque or *jámi'* by Sultán Selím. Upwards of 500 feet above the town is a longitudinal valley, communicating with Báýás, by a road which passes by the side of the Mount, called Beilán. In this valley are the ruins of a Christian church. Between the north-western foot of the Beilán-pass and the sea is a rocky site with abundant springs and caves. This is supposed by Rennell to be the site of Myriandrus.

Beyond is the almost depopulated Alexandria, Alexandretta, Iskenderún, or Scanderoon; and between it and Myriandrus, the ruins of Godfrey of Bouillon's castle and some stone fortifications, which, in the 'Mecca Itinerary,' are said to have been built by Ibn-Abí Dáwud in the time of the Khaliph Wáthík. Scymnus of Chios and Strabo attribute the foundation of Alexandria to the conqueror of Darius. A traveller of the thirteenth century, Willebrand of Oldenburg (Itin. Terr. Sanct. p. 135), says that, according to the tradition of the natives, the town was built in one day by Alexander for his horse Bucephalus, and that he gave it its name.

The bay at Iskenderún extends still further east than the town of the same name to the foot of the mountains, and the traveller who proceeds by land to Báýás must pursue a circular direction till he reaches a ruined marble gateway, where the mountain acclivity descends with a gentle slope, covered with brushwood, into the sea. Over this narrow pass the road is carried with care, and, although steep, is paved throughout. This ruined gateway, presenting at sea the appearance of two columns, has been called by sailors "Jonas' Pillars." *

The road, which was formerly carried through the marble gateway, has, in its southern continuation, been swept away by the sea; and the present one is carried higher up on the hill-side. Both are constructed in a coarse limestone conglomerate. This pass, in the 'Mecca Itinerary,' is called Şakál Tútán.†

* The ruins consist simply of two crumbling walls 13 feet 6 inches in length, and 3 feet in thickness, the length of the plinth being 17 feet. The width of the gate walls was 20 feet. The walls are built of blocks of white and black marble, from 2 to 3 feet in length, 1 foot 10 inches in depth, and 18 inches in width. This ruin has been noticed by many travellers, as Pococke, Niebuhr, Kinneir, Drummond, and, indeed, it must be observed, by all who travel along this road.

Also, in a slight outline of M. Callier's travels (p. 225, Vol. V., of the *Bulletin de la Soc. de Géog.*), it is said, "to the north of the defiles, the acclivities of Amanus recede from the shore, the plain develops itself, and is soon a league in width: here M. Callier thought he recognised the field of Issus." This is very general, and may apply to the plain of Báýás, as well as to that of the Pinarus. It is much to be regretted that so long a space of time, now nearly four years, has elapsed since M. Callier's journey in the East, before any account of it has been published.

In No. 24 of the Views in Syria and Palestine, published by Fisher and Co., there is a well-executed sketch of part of this coast; it is taken from immediately south of the Sakal Tútán, and embraces the approach of Amanus to the shore, the plain of Báýás, and in the distance the rise of the country towards the Pinarus.

† "Beard-catcher." (Turk.)

Immediately beyond the marble gates the plain begins to widen, and there is a modern Turkish castle called Merkez,* upon the top of a hill about 300 feet high, which commands the pass,—but the fort is now dismantled.

Half a mile beyond, is a stone wall, which crosses the plain from the mountains to the sea, where it terminates in a tower; and a short distance beyond this wall, is a river about forty feet in width. Following the river up to the point where it issues from the mountains, a distance of nearly two miles, more ruins are met with, and also traces of a double wall, between which the river flowed. Above is a steep and remarkable pass (Baghrás Beli).† There is also at this point a pretty village, which is called Merkez, and a little beyond the village, abundant springs issue and give birth to another river, which loses itself in the sea about three miles to the north of the former. The inhabitants called the rivulet which comes from the mountains Merkez-sûi. It is the ancient Kersus. Between it and the more northerly river there is a small pile of ruins, which appear to be a mass of Roman brickwork.

Between the Kersus and Báyás, or Páyás, two headlands advance into the sea, known as Rás Báyás and Eski Rás Báyás. Beyond the most northerly is a little gulf with a few feet of water only, in which are the remains of a pier and tower: close by, is a small village, and, in the plain and commanding the harbour, a modern castellated building.

The public buildings belonging to the town of Báyás lie due south of the castle, half a mile across the plain. They are abandoned, but in perfect repair, and consist of a mosque or mesjid, castle, khán, bázár, and baths of superior construction and considerable beauty and solidity. The houses are all destroyed. A mile to the north-east there is a village with a governor and a body of soldiers placed in a secluded position near the entrances of a transverse valley, which has an opening into the chain of Amanus, and affords a summer pass over the mountains.

The public buildings of Báyás were erected by Sakulí-Mohammed Páshá, known by the name of Ibráhím Khán-Zádeh, one of the viziers of Sultán Suleimán. There can be no doubt that Báyás is the Baïæ of the Romans, a favourite bathing-place. Pococke supposed it to be Issus and its river the Pinarus, and Mr. Williams identifies it with Myriandrus. The shore is high and dry, the vegetation truly beautiful, and the scenery magnificent.

There are two villages between Báyás and the Issus,—the

* "Centre." (Arab.)

† "Baghrás, its fork." (Turk.)

most southerly Yüzler,* the northern Kōi Chái or "village-stream."†

The Pinarus or Issus flows between the latter and the village of Urzin or Urtsulí: it is called the Delí Chái or Mad River, and, at the time we visited it (January, 1896), was about forty-five feet wide, on a stony bed: it comes from the Amanus, flowing across the plain in a direction a little south of west.

The plain to the south of Delí Chái is about seven miles wide; and around the villages and near the sea it is much cultivated and diversified by orange and lemon groves. It is crossed by the stony beds of several mountain torrents, and a considerable brook runs through Kōi Chái.

North of Delí Chái the country begins to rise. The plain is uncultivated, but everywhere covered with green sward, and generally with shrubs: toward the higher part it is intersected by ravines. The valley of the river penetrates to some depth into the hills, and to this point the Amanus preserves its direction of S.W. and N.E., gradually receding more and more from the shore; but here the base of the mountains advances farther to the westward into the plain.

At this point the gulf bends round to the west, leaving at its north-eastern point a low plain which is bordered to the north by nearly insulated hills of no great height, and which themselves are separated from the Amanus by a valley which is prolonged to the north-east to some distance, until closed up by hills, which stretch along the foot of the mountain-chain.

On the western side of this valley, at the foot of a hill, and about seven miles from the sea, are the ruins of a considerable town, in which many public buildings may still be traced, and where an acropolis and aqueduct still exist in some perfection. This is probably the town of Nicopolis, which, according to Stephanus Byzantinus, was first called Issus by the Macedonians, in honour of the victory gained there; but two much better authorities, Strabo and Ptolemy, speak of Issus and Nicopolis as two distinct places.

To the west the plain begins to narrow: near to the sea, south of Issus, is a *tell* or mound, called Kará-Ḳayá,‡ composed of black lava-pebbles, and having ruins of lava-walls upon the summit. About four miles to the west of this *tell* a river traverses the plain. It is called the Búrnáz Sú, and is crossed by a bridge. The plain is here covered by a sand-flood, and is not above two miles in

* Probably Gózier. "Eyes or springs."

† Near Yüzler are some extensive indications of ruins which might have been supposed to belong to Issus, if Arrian had not described Darius as advancing, after marching upon Issus, next day to Pinarus. If Issus and Nicopolis were two distinct places, one of them remains to be discovered.

‡ "Black-rock" (Turk.)

width, being bounded to the north by a range of low sandstone hills. Ruined arches are seen peeping in two or three places out of the sands. They are constructed of tile-bricks.

The hilly country is soon united with the sea by loftier mounds of Plutonic rocks, and the direction of the shore changes to the south-west.

In this plain, thus enclosed between hills and the sea, are many ruins of former times : a little brook runs through its centre, and passes by the foot of a round *tell*, in part artificial, having the remains of fortifications on its top ; remnants of forts and arches occur in the plain around. These ruins, belonging probably to the Castabulum of the Romans, are designated in the 'Mecca Itinerary' as 'Uzeir (Esdras), otherwise called Matak.

To the north, a pass through the sandstone range is guarded by a gateway and tower of tile-brick ; ruins of a peculiar character, consisting of two masses of an imperfect obelisk-like form, having four sides, with re-entering angles at each corner, and slightly tapering towards the summit. A building in the same style occupied the other side of the pass ; and the two appear to have been connected by a limestone wall. The pass here was upwards of 500 feet in width. To the north-west, the great Constantinopolitan road follows the direction of the rivulet through a valley where the sandstone chain bends round to meet the higher hills of Plutonic formation. Half-way up this pass, about 300 feet above the level of the sea, and where the pass is scarcely 500 feet in width, is an arch of elaborate workmanship ; polygonal stones fitting with great nicety, arranged in courses and of the same height, and rather noble dimensions, built of limestone and flanked by walls of angular masses of lava, closely fitted, and of the third era of Cyclopian architecture, according to the divisions made by Mr. Hamilton,* and as in Argolis and other Phocian and Bœotian cities. The remains of a causeway are also still in existence. These gates are called *Karâ Kapû* (or black gate), *Tímûr Kapû*, or *Demir Kapû* (or the iron gate), in the 'Mecca Itinerary.' The country was examined on two different occasions from these gates to the south-west to 'Ayâs, and to the north-west by *Kûrd Kûlâk*† (*Tardequeia*) to *Missisah* (*Mopsuestia*), where other ruins occur to throw light upon the character of those observed surrounding the gulf of Issus from point *Râs el Khanzîr* to the mouth of the *Pyramus*.

In discussing the questions of historical geography connected with the country we have just described, one of the most immediate causes of error has been a passage of Strabo (xiv. Casaub. p. 676), in which he says, "after Mallus (*Mopsuestia*),

* *Archæologia*, vol. xvi.

† "Wolf's ear." (Turk.)

comes *Ægæ* ('*Ayás*), a small town with a road-stead; then the Amanian gates with an anchoring station." The Amanian gates may either apply to the *Beilán*-pass, to the gates of *Kersus*, or to the marble gateway of *Sakál Tútán*, both near *Iskenderún*; but there can be no doubt, from another passage (lib. xvi. p. 751), when he says "*Pagræ* is situated on the road which, traversing *Amanus*, leads from the Amanian gates into Syria," that one of the last two is meant. "After *Ægæ*, *Issus*," continues *Strabo*, (xiv. p. 676) "a small town with an anchoring station, and the *Pinarus*,* where the battle was fought between *Alexander* and *Darius*, and the gulf called *Issic*. On it (the gulf) are the cities *Rhosus* and *Myriandrus*, and *Alexandria*, and *Nicopolis*, and *Mopsuestia*, and the place called 'the Gates,' the boundary between the Syrians and the Cilicians." The gates referred to in this passage appear to be the *Kára Kápú*, or black gate.

Ptolemy's description of the sea-coast is,—“In *Cilicia*, the *Cydnus* (*Társús River*), the *Sarus* (*Saihán*), the *Pyramus* (*Jaihán*), *Mallus* (*Misis*), the village *Serrepolis* (unknown), *Ægæ* (*A'yás*), and *Issus*. Inland the Armenian gates" (*Kulleh Búgház* pass in *Taurus* from *Adanah* to *Kóniyeh*). "In Syria after *Issus* and the Cilician gates (*Sakál Tútán*), *Alexandria* near *Issus* (*Iskenderún*), *Myriandrus*, and *Rhosus*. Inland the Syrian gates (*Pass of Beilán*). Few difficulties present themselves, where there is an accurate knowledge of the position of places, in assigning the localities of what, in historical geography, has often been confusedly described and variously named.

It is well known that *Cyrus*, in the expedition of which so admirable an account has been transmitted to us by *Xenophon*, led his army by these passes. According to the narrative of that general and historian,† *Cyrus* marched from the *Pyramus* (*Jaihán*) in two days' march, fifteen parasangs, and arrived at *Issus*, the last town of *Cilicia*, situated near the sea, a large city, rich and well situated, where he staid three days. "Hence *Cyrus* made, in one march, five parasangs to the gates of *Cilicia* and *Syria*. There were two walls of which the inner, next to *Cilicia*, was occupied by *Syennesis* with a guard of *Cilicians*, and the outer, next to *Syria*, was said to be defended by the king's troops. Between these two walls runs a river called *Kersus*, 100 feet in breadth. The interval between them was three stadia, or 625½ yards, through which it was not possible to force a way, —the pass being narrow, the walls reaching down to the sea,

* *Pindus* in the MS. of *Strabo* and the text of *Casaubon*. This variation from the form in *Arrian* has been pointed out to the author by *Mr. Long*, to whom he is anxious to express his obligations for several valuable hints and corrections. *Pinarus*, in *Fischercke's* edition of *Strabo*, is a correction on the authority of *Plutarch* (*Vita Alexandri*, i. 20) as well as *Arrian*.

† *Xenophon*, *Anab.*, I. iv. 4.

and inaccessible rocks above. In both these walls stood the gates. Hence Cyrus proceeded through Syria, five parasangs in one march, to Myriandrus, a city near the sea, inhabited by Phœnicians, at which, being a trading town, where many ships lay at anchor, they continued seven days."

The river Kersus corresponds with the Merkez of the present day; it traverses ruined walls at its entrance into the plain, but now falls into the sea at a short distance from where the walls terminate. Rennell supposed a wide space of alluvia to have been deposited at or near this pass, but such is not the case, for the walls terminate at the present day in the sea. As the two walls were distinguished as outer and inner, and in 'Cilicia' and 'Syria,' the description has reference to ruins observed at about half a mile to the north, and the walls and ruins which stretch from the sea up to the rocks south of the Kersus.

It may be observed, in connexion with this, that, according to his historian,* "In order to gain this pass, Cyrus sent for his ships, that, by landing his heavy armed men both within and without the gates, they might force their passage through the Syrian gates if defended by the enemy."

The next most important texts are those of the historians of Alexander, who also invaded the East by the same road, and there met and conquered the Persian king.

Q. Curtius (iii. 7), who is supposed to have derived his history from the memoirs of Aristobulus and Ptolemy, relates that "Alexander, having moved, and thrown a bridge across the Pyramus, arrived at the city of Mallus:" in two days more he reached Castabalum. From this it would appear that Mallus, afterwards Mopsuestia, was the present Missisah. Castabalum appears to have been at or beyond the Kára Kapú. There he met Parmenio, who had been sent forward to examine the road through the defile (Kára Kapú) which lay between them and Issus. This general, after having made himself master of the passes, left a sufficient guard there, and then captured Issus, whence the barbarians had fled. He then advanced from Issus, dislodged the enemy who occupied the interior heights (Amanus?), placed there strong bodies of troops, and having hurried back, announced his own success to the king. From Castabalum, Alexander advanced to Issus. According to Arrian (ii. 6), "before Alexander had quitted Mallus, he was informed that Darius, with all his forces, was encamped at Sochi. This place is in the Assyrian territory, and distant about two days' march from the Assyrian gates." The gates here alluded to are the pass in Amanus, which is to the north-east of Issus. The road is still used in going from Báyás to Mar'ash, but is not practicable in the winter season, and in the

* Anab., I. iv. 5.

summer could only be so to the light (Parthian) horse, which did not alone constitute the army of Darius.

"Next day," says Arrian, "Alexander advanced (from Mallus) to meet Darius and his Persians; and after surmounting the pass, encamped on the second day at Myriandrus." The omission which occurs here of the march to Issus, renders it doubtful whether the pass alluded to means that between Mallus and Issus (Kará Kapú), or that between Issus and Myriandrus (Şakál-tútán), but most probably the latter.

"By chance," to continue the narrative of Curtius, "on the very same night Alexander arrived at the pass by which Cilicia is entered"—(This alludes evidently to where Cilicia is entered from Syria (Şakál-tútán), which is corroborated by the continuation of the narrative by the same historian)—"and Darius at the spot called the Amanian gates. Nor did the Persians doubt that the Macedonians had fled, as Issus, captured by them, had been left unguarded." No great importance can be attached to the distance of an army's out-post given to Alexander, under circumstances of considerable anxiety, if not alarm; but still the distance, if we suppose the Olympic stadium to have been that used by the Macedonians, as I have uniformly found to be the case in Babylonia, will amount to about ten miles, which is not very far from what might *à priori* be supposed to be the position of the out-posts of an army occupying the southern bank of the Issus. "Alexander could scarcely believe them, and sent scouts, who ascertained the truth; he then ordered his men to prepare for battle, and marched back at twelve o'clock at night. At break of day they arrived at the narrow pass which they had determined to occupy."

Arrian (ii. 7) gives the following account of Alexander's march at this interval:—"Darius crossed the mountain by the pass called the Amanian Gates, marched upon Issus, and thus placed himself in the rear of Alexander, who was ignorant of his movements.—Next day he advanced to the Pinarus. When Alexander heard that Darius was in the rear, as he did not think the account credible, he embarked some of the accompanying troops on board a thirty-oared galley, with orders to examine into the truth of the report. These sailed up in the galley, and as the sea here forms a curve or bay, they more easily discovered the Persians encamped, and made their report that Darius was at hand.

"Alexander ordered his troops to refresh themselves, sent a few of the cavalry and archers in the direction of 'the gates,' in order to reconnoitre the road, and placing himself, as soon as it was night, at the head of his army, set out in order to occupy 'the gates' a second time. About midnight he again made himself master of the pass, and after carefully stationing sentinels upon the rocks, allowed his army to repose for the remainder of the night."

Throughout this detail Arrian keeps in excellent consistency with his first statement, that Alexander went to Myriandrus, and that "the gates" which he occupied a second time were those which occurred between Myriandrus and Issus. The *Şakál-tútán* was the midnight halt. Had Myriandrus been the present *Báyás*, as advanced by Mr. Williams,* there would have been no necessity to send a reconnoitring galley, since the army on the ridge above Pinarus would have been easily recognisable. There are no gates between *Báyás* and Issus.

"With the dawn he descended from the gates along the road, and as long as the pass was narrow he led his army in columns; but as the defile expanded" (which it does considerably about four miles beyond) "he regularly formed his column into line, by bringing up his heavy-armed troops, successively to occupy the vacant space between the main column and the mountain on the right, and the sea on the left."

There is also a subsequent description of the arrangements which Alexander made to prevent his right wing from being flanked by the left wing of Darius's army, which corresponds with the condition of the country, the mountains descending so rapidly to the south-west from the valley of the Pinarus, that the army which occupied that valley would, in the deploying of the line, be enabled to command the extreme wings of the enemy on the south.

Mr. Williams has objected to these distances as too great; although they are the same as those Alexander marched when not expecting Darius from Tarsus to Mopsuestia, on account of the mountain to be crossed between the Pinarus and Issus, and the gates to be surmounted between Issus and Myriandrus. There is some hilly country at *Kúrd Kúlağ* to be crossed, and a low mountain-chain, the pass of which is not however 500 feet in height, and the slope is gentle to the *Jebel El-núr*, 'Mountain of Light,' between *Missisah* and *Castabalum*; but the *Kará Kapú* is not 200 feet, and the *Şakál* scarcely 100 feet above the Mediterranean. The points in historical geography of the greatest importance which Mr. Williams advocates are, that *Kará Kapú* was the midnight halt of Alexander. Now Issus is to the east of *Kará Kapú*, and would in that case be before Alexander. How could Darius by crossing *Amanus*, then, have placed himself in the rear of the Macedonians? How could he, by descending to Issus, have been in the rear, for by marching to the Pinarus, he would have placed himself still farther in advance of his enemy, instead of approaching them from the rear, as Arrian relates?

According to Xenophon, the Greeks marched in one day from

* On the Geography of Ancient Asia. London, 1829.

the pass (Kersus) to Myriandrus; and according to Arrian, Alexander and his army quitted Myriandrus as soon as it was night, and arrived at the pass (Sákál-tútán, which was not quite so far) at midnight. If, therefore, says Mr. Williams, the pass was at Kará Kapú, Myriandrus must be represented by the modern Báyás. If this were the case, the armies of Cyrus and of Alexander must have marched a distance of thirty miles, that of Alexander between sunset and midnight; and where is Issus, which, according to Mr. Williams himself, is to the south-east of Kará Kapú?

The opening which I have described as occurring in the Amanus above, or to the east of Báyás, has been noticed by Captain Corry, and also by most modern map-makers* as the pass by which Darius came down to Issus; but if this were the case, it certainly is not that by which he effected his retreat after the battle, and which yet is stated to be the same as that by which he approached from Sochi to Issus; for he would have had to force his way through Alexander's victorious army, which occupied the plain on the Pinarus, between Báyás and Issus. Pococke calls it the middle of the three passes into Cilicia. But the rivers which flow into the lake at Antioch are no more avoided by passing from Báyás to Aleppo, than they are by passing from Beilán; and the silence of Xenophon upon this subject remains in the same mystery.

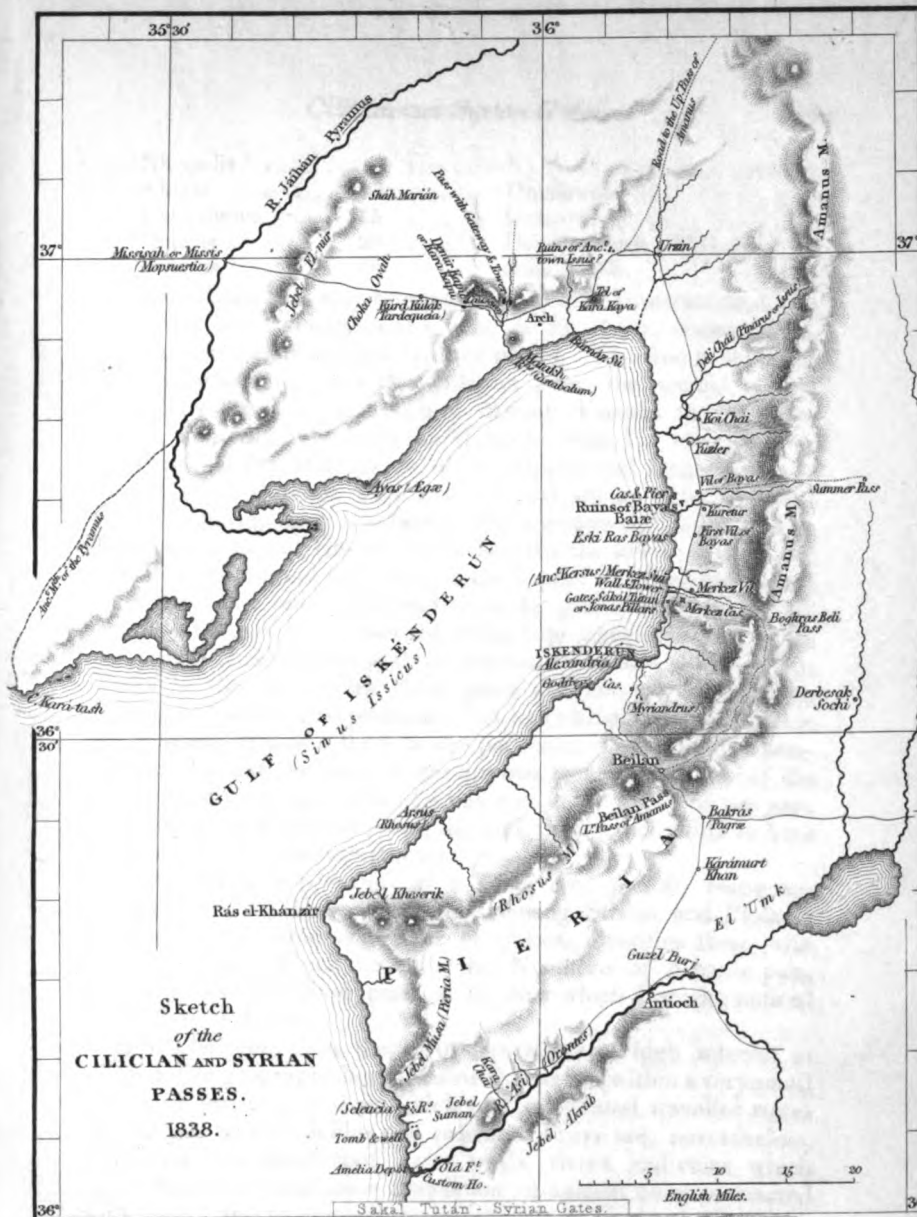
It has been supposed that Abrocomas, in his retreat before Cyrus, retired along the sea-coast by Rhosus and the site of Seleucia; and Mr. Williams has also asserted, that it was by the same road that the Macedonian Amyntas, and his Greek mercenaries, reached the Phœnician Tripolis after the battle of Issus; but it is to be objected to this line of retreat, that the Jébél Músa terminates in abrupt and nearly perpendicular cliffs over the sea, not far to the north of Seleucia; and though there is a horse-road over Rhosus, it is tedious and difficult.

Cicero, in his letter to Cato,† says, "There are two passes from Syria into Cilicia, both of which, from their narrowness, can easily be defended by a few troops; nor can anything be better protected than Cilicia on the Syrian side." These passes are evidently the upper Amanian pass (the pass of Darius) and the lower Amanian pass (the pass of Beilán). Cicero, also, in the same Epistle, when he gives the reasons, why he led the army which he commanded, as Proconsul, into Cappadocia, rather than into Cilicia, says—"Duo enim sunt aditus in Ciliciam ex Syriá."

The Antonine Itinerary‡ furnishes us with a line of road between Nicopolis and Zeugma, by the upper Amanian pass.

* See Modern Traveller. Syria and Asia Minor. † Cic. Ep. ad Fam. xv. 4.

‡ Cilicia, Ptolemæi Geographia, Ed. Bertii, p. 15.



Nicopolis			
Aliaria	13	Unknown.	
Gerbedissus	15	Unknown.	
Doliche	20	Doliche, north of 'Aintáb.	
Zeugma	24	Rúm-kál'ah.	

Major Rennell, it may be remarked, in his 'Illustrations of the History of the Expedition of Cyrus,' p. 38, *et seq.*, distinguishes, with his usual critical sagacity, four passes. The first is the Kuli Bógház, which he calls the Cilician pass; the second is that formed by the near approach of Mount Amanus to the Sinus Issicus, and which he calls the Maritime pass, but very properly observes that the descriptions of Xenophon and Arrian refer to distinct sites, although very near to each other. He considers Strabo as having been ignorant of the existence of this pass. The third pass is that of Beilán, which he calls the lower or Southern pass of Amanus, and the fourth is the Upper or Northern pass of Amanus. The only omission here is the pass of Kará Kapú and the hills beyond it, so essential to the true understanding of the movements of Alexander and his general Parmenio. In the Appendix to the same work these gates are, however, alluded to, without feeling their importance; but he judiciously advances that the causeway met near them is the pavement of a street of Castabalum. Indeed the Kará Kapú appears to have been one of the gates of that city; the piers of a gateway in the valley to the east, to have marked another; and the arch in the sand hills to have formed a third or eastern gateway.

Colonel Leake (*Journal of a Tour, &c.*, p. 209) being acquainted with the Kará Kapú, and viewing Strabo and Ptolemy as naming the same two Pylæ or passes, identifies these with the Kará Kapú, which he calls the Northern or Amanic pass, and with the Maritime pass, at or near which Pococke noticed the Pillars of Jonas.

It will be seen, then, that many questions of high interest in comparative geography here present themselves within a very small extent of territory, and in which one celebrated traveller states that he saw neither defiles nor passes. There are, nevertheless, in that circumscribed spot, gates, walls, rivers, and ruins, which have almost every one some association of ancient times connected with them; and to unravel the importance to be attached to each of these, has been the humble endeavour of the author of this essay.

It remains only to acknowledge the obligations due to Colonel Chesney, for the use of the geographical points obtained by Lieutenant Murphy, R.E., in the neighbourhood of Iskenderún, and which have been used in the construction of the accompanying sketch map.

XIV.—*On the Bore, or Rushing Tide, in the Gulf of Cambay, and at the entrances of the Máhi and Sábarmatí Rivers.*

By Lieut. R. ETHERSEY, Indian Navy. Communicated by the Bombay Geographical Society.

THE Gulf of Cambay lies between $21^{\circ} 5'$ and $22^{\circ} 17'$ north latitude, and $72^{\circ} 19'$ and $72^{\circ} 51'$ east longitude; it is seventy-two miles long, and varies considerably in breadth. At the entrance between Vaux's Tomb and Gópnát'h Point it measures thirty-two miles across, which in a distance of ten leagues narrows, between B'aróch Bar and the island of Perím, to eight miles; it then opens out again to nineteen miles, between the entrance of the Dhádar River and Bhaunagar on the Káthwár coast; this space, with the exception of three channels, is occupied by extensive shoals. The Gulf contracts again to ten miles between Góngwá and the western coast, on the same parallel with a remarkable spit of land which has formed within the last twenty years. Sand-banks extend from the shores on either side, which leave a channel between them towards the centre of the Gulf from three and a half to four and a half miles wide.

From the head of the Malacca banks* in lat. $21^{\circ} 10' N.$, to the parallel of Lóhára, a point on the northern side of the entrance of the Narbadá River, in $21^{\circ} 38' N.$, the Gulf is, with the exception of the Bhagwá Sands,† clear of shoals, with irregular soundings from eight to thirty fathoms; but above this parallel it is filled with extensive shoals and sand-banks, having several deep channels between them, all of which are liable to shift, particularly during the rains. These channels all take a northerly direction, and the two principal ones unite in $22^{\circ} 7' N.$ and $72^{\circ} 36' E.$, a little below *G* on the plan, forming a channel three and a half miles wide, the greatest depth of water in this channel being six fathoms; it takes a north-easterly direction, runs close past Cambay Creek, from which it crosses to the south-eastward, and enters the Máhi River.

Another channel extends in a winding direction from the Sábarmatí River close past the Amlí Creek, from whence it keeps pretty close to the shore, and joins the main channel in about $22^{\circ} 9\frac{1}{2}' N.$ below the Bore rocks; in both of these channels the flood-tide makes with a bore or wave, caused, wherever it is observed in this gulf, by a rapidly flowing tide forced through a narrow obstructed passage.

* Lieutenant Ethersey, in addition to his survey of the Gulf of Cambay from Diu Island, along the Káthwár Coast, around the head of the Gulf, and down its eastern shore as far as Surat, has lately examined, in detail, these extensive shoals, and thereby rendered an important service to hydrography.—Ed.

† So called from Bhagwá, a village on the north bank of a small stream called the Sená River, which takes its rise at Segwá and Sehván.

The rivers which empty themselves into this gulf are the Narbadá, Dhádar, and Máhi,* from the eastward; the Sábar-matí from the north; and the Bhádar, or Gómá, from the westward: the three latter only can have any effect on the Bore, which, in the fine season, is trifling, as the discharge from them is then very inconsiderable; for the channel opposite Dehwán, on the north bank of the Máhi, is only 300 yards wide, a few inches deep, and the stream scarcely perceptible. Again, at the small pagoda marked *H* in the chart, in $22^{\circ} 24' N.$, on the east bank of the Sábar-matí River, the channel at low water is only 150 yards wide, with a mean depth of two feet, and the stream is too weak to be ascertained by the log.

The tides throughout the Gulf are extremely rapid, and their rise and fall very large; the whole coast is low, overflowed for some distance inland at high spring-tides, and intersected by numerous small creeks and inlets.

Its situation being such as to receive the full force of the tide-wave coming from the southward and from Díú Head, the south point of the peninsula of Gujerát, lying between the Gulfs of Cambay and Cutch, along the Kát'hiwár coast, together with its peculiar shape, will, I think, sufficiently account for the strong tides which are experienced here; for at Perim, twenty-six miles from the entrance of the gulf, the stream is forced through a space four times less than it occupied between Vaux's Tomb and Góp-nát'h Point; and again, at *G*, below the Bore rocks, thirty-two miles further north, it flows into a channel only one-ninth of its original width, being not quite half of its breadth at Perim; from which circumstances the velocity of the tide is not only considerably increased as it flows towards the northern parts of the gulf, but the water is also forced up to a higher level.

The eastern or principal bore rises five miles to the west-south-westward of Cambay Creek, and is not perceptible in the neap-tides without the previous spring-tides have been very high, when it may be observed slightly through the quarter. It generally commences when the springs begin to lift; the wave increasing daily in height, as the tides gain strength; and it is at its greatest height about two days after new and full moon; it also varies with the night and day tide, because the higher the tide the greater is its velocity; and as the two tides differ from six to eight feet, and the flood of both runs the same length of time, the highest tide must have the greatest velocity, and hence the wave of the bore will be highest with the greatest tide; the night tide both of new and full moon is the highest.

By a reference to the chart it will be seen that the channel

* Vulgó, M'hái.

between the Bore rocks and *A* on the eastern sand-bank is quite clear, and free from shoals. It is four miles and a quarter wide, and the greatest depth six fathoms, where I found the velocity of the tide to be as follows, the direction being N.E. and S.W. :—

		K.	F.	Rise and Fall.
High Springs	Flood	6	0	33 feet
	Ebb	7	2	
Ordinary Springs . .	Flood	4	4	25 „
	Ebb	6	2	
Neaps	Flood	3	6	18 „
	Ebb	5	0	

From this point (*A*) the channel begins to narrow with a decreasing depth of water, until at *B*, seven miles higher up, it is only 550 yards wide, the greatest depth of water being seven feet. It is at this point that the tide first rises in a wave; when the flood makes, this may be seen running along both sides of the sand-banks, and it soon spreads across the channel, rapidly increasing in height; for by the time it passes *C*, a distance of not quite one mile and a half, it is nearly as high and has as great a velocity as it attains in any part of its course. From *C* it runs close to the high cliffs as far as *D*, spreading entirely across the channel, and rushing along with a loud roar. The small sand-bank which commences at *D* turns it to the southward of east; and when abreast of Cambay Creek it is divided into two parts by another sand-bank, the most considerable of the two, taking a south-easterly direction towards the south bank of the Máhi River, and continues on this side as far as *E*, where it crosses to the north bank, near Dahwára, close to which it pursues its course to the village of Dehwán, where it is entirely broken and interrupted by a number of sand-banks, but proceeds several miles further up, although with greatly diminished height and velocity.

The other part of the divided stream runs to the eastward, and is soon exhausted, there being no free channel for it, and the banks are greatly elevated with gradual slopes, over which it flows very slowly.

The following data show the result of my observations on the ordinary spring-tide on December 24, 1836, between the point *C* and Cambay Creek; the highest part of the wave being three feet and a half, its velocity nine knots, which was the utmost strength of the tide after the bore had passed :—

H.	M.	K.	F.	H.	M.	K.	F.
0	5 after	3	6	0	30 after	6	0
0	10 „	5	7	0	40 „	7	0
0	20 „	4	4	0	50 „	6	2

Seven knots was the strongest.

The flood ran three hours: the rise and fall of the night tide

was twenty-three feet; that of the day tide sixteen feet six inches; giving a difference of six feet six inches.

During the first hour the rise of tide was fifteen feet; in the second, six feet; and in the third, two feet.

In the first hour the water rose six feet during the first ten minutes, which will give some idea of the rapidity with which the tide rises.

January 7, 1837.—Very high spring-tide, nearly up to the mark of the tide in the rains; between the point *C* and Cambay Creek the highest part of the wave rose six feet, and its velocity was ten knots and a quarter, the strength being as follows:—

H.	M.		K.	F.	H.	M.		K.	F.
0	20	after	4	6	0	50	after	8	0
0	30	„	4	6	1	00	„	7	0
0	40	„	7	6	1	20	„	6	0

The flood tide ran three hours and two minutes. The rise and fall of the night tide was thirty feet eleven inches, the day tide twenty-three feet; the difference being seven feet eleven inches.

	FT.	IN.
Rise of tide during the first hour . . .	18	4
Ditto „ second hour . . .	8	4
Ditto „ third hour . . .	3	6

The ebb tides run steadily, but do not acquire their greatest strength until more than half-tide has passed, when the high banks are uncovered, and the stream is confined to its proper channel.

Jan. 10, 1837.—Near the village of Dehwán, on the north bank of the Máhi, the highest part of the wave was seven feet, and its velocity ten knots. The rise and fall of the night tide was twenty-two feet; but by the mark of the tide on the shore, this was one foot lower than it had been a day or two before, which is too trifling to have diminished the effect of the Bore. I was not able to measure the rise of the tide here, having no convenient place to erect a scale; it ran only two hours fifty minutes; the greatest velocity of the flood was seven knots, and the ebb six knots two furlongs.

The Western Bore is so nearly similar to that just described, in almost every particular, except its direction and effect, that a very few additional remarks will be sufficient to point out the small difference between them; and even that would have been superfluous had I not found a very great alteration in the banks and channel subsequently to my former report.

I found that from 700 to 1300 yards of the western shore had been washed away through the whole space from *I* to the east point, which is 1300 yards farther south than its former position; the bank all along, being a sandy cliff, continues still to fall with

such frequency, from the action of the tide undermining it, that, in a short time, the coast will be quite straight from the Amlí Creek to below that which is now the east point. Tons of this sandy bank are detached from the shore at one time, and these masses continue to fall into the water at different parts in such quick succession, that the report sounds at a distance like heavy artillery; the top of these cliffs, at two-thirds ebb, being from eighteen to twenty feet above the level of the water.

Again, the high sand-banks to the eastward of the Amlí Creek, which were only partially covered by the neap tides, have been swept away; nothing but low sand-banks remaining in their place, and the channel leading to the Sábarmatí River, which before took a N.N.E. direction from Amlí Point direct for that river, now turns to the N.N.W. at Amlí Point, and runs along the shore close past Amlí Creek, where it turns to the N.E., for the Sábarmatí River.

The Bore on this side is now greatly diminished, the cause of which will, I think, be evident, when it is considered that formerly, instead of the whole force of the tide setting, as at present, to the N.E. past the Bore rocks, it took a N.N.W. direction, below the above rocks, right into the Western Channel, which is only now fed by a portion of the tide from the main stream.

At present the wave of the Bore on this side, as on the other, is not perceptible as formerly at the neap tide, but is confined to the springs, at which time it takes its rise at *F*, where the channel is only 150 yards wide, with three feet of water in it; its course is close to the shore as far as *B*, where it turns, and has to encounter a stream running at the rate of two miles an hour. I found its height here increase to four feet. After passing this, the channel widens a little, having low sand-banks, which the water spreads over, the wave decreasing to one and a half and two feet, and continuing at this height past the Amlí Point, where it again runs close to the steep bank, and increases to three feet; it thus rushes along until it comes near to the Amlí Creek, where it has to encounter a stream of two knots and a half, and, in consequence of the channel's turning, its whole force is directed to that part of the high sand-bank marked *b*, where the wave was five feet; after passing this, it gradually diminishes to a few inches, for the banks are very low and the water so shallow that it can scarcely be called a channel, so that the tide is not confined, but flows over the banks in all directions. It forms again, however, at the entrance of the Sábarmatí, where the highest part was two feet: it continues its course (from this to one foot and a half) nearly to *H*, one mile past which it is lessened to a few inches.

Dec. 9, 1836.—Between *b* at Amlí Creek and Amlí Point, the highest part of the wave was five feet, its velocity eight knots and

a half. The velocity of the flood tide after the Bore had passed was as follows:—

H.	M.	K.	F.	H.	M.	K.	F.
0	10	after	3 2	0	50	after	5 6
0	20	„	4 7	1	00	„	5 4
0	30	„	4 4	1	20	„	5 0
0	40	„	5 0				

Rise and fall of the night tide, twenty-eight feet; day tide, twenty-one feet two inches; the difference being six feet ten inches. The flood ran three hours and five minutes.

The velocity of the wave was ascertained by measuring a distance from two to three and a half miles in those parts where the waves ran close to the shore, and noting the time it took to go from one station to another by a good watch. The height of the wave off Cambay, Dehwán, and the Amli Creek, was ascertained by a pole, having feet marked on it, and in other places by estimation. The velocity of the flood was measured by the common log-line and glass—the patent log being of no use, from the irregularity of the stream, as it would only have given a mean rate.

I have given the greatest heights of the wave during each spring tide; but this does not continue to be the same throughout its course, being affected by several circumstances, which cause it to vary at different distances; for instance, at those points marked in the chart *a a*, in the Máhi, and *b b*, on the western side, where the bank is steep, forming a concave, and the stream is strong, while the direction of the Bore is towards the steep bank, the wave at these points will be greatly increased, in consequence of the force of the tide being directed to one point, as well as by the resistance of the stream. It is at these places that the wave frequently flows quite perpendicularly, having the appearance of a wall, when it curls and breaks with a thundering roar.

In those parts of its course, where the sand-banks are low on both sides, with a strong stream running in the centre (which is the case in several parts on both sides), the middle part of the wave will be retarded, and increased in height by the resistance of the ebb; while towards each side, which is out of its influence, the wave proceeds with undiminished velocity, the whole forming in a crescent shape across the channel.

By the foregoing observations it will be seen that the tide does not attain its full strength until forty or fifty minutes after it has made: it is until that time very irregular, coming with a sudden burst, with great velocity, and then decreasing again slightly. The tide never attains the same velocity as the wave of the Bore; why this is the case I am not able to determine.

In *February*, 1835, in order to try the effect of the Bore on a large-sized bander boat, and at the same time to ascer-

tain the strength of the stream after the wave had passed, at spring tide I anchored the boat half a mile to the northward of what was then the last cape on the western side of the Gulf, and it proved a more dangerous experiment than I had anticipated; although I anchored in five fathoms, the boat grounded at low-water, and was left high and dry. A few hours afterwards, the noise of the Bore was heard, when every precaution was immediately taken for the safety of the boat. The night was still and calm, and its roar, as it approached, echoing among the neighbouring cliffs, was truly awful. It struck the boat, lifted her, and threw her violently round on her bilge; in which position she was forced before it, broadside on, for the space of five minutes, the grapnel being of no use, for it was carried faster than the boat. I fully expected she would go to pieces, so violently was she shaken. However, no accident happened; for, on getting to a hollow in the sand-bank, which was quickly filled, she righted, much to my satisfaction. About twenty minutes after this I hove the log, and found the stream running seven knots and a half, at which time the boat, I think, could not have been driving less than two knots and a half per hour, which would make the velocity of the stream ten knots. This I did not think too great; for, although calm, the water frequently came over the boat's bows.

Additional Observations on the Remarkable Tides in the Gulf of Cambay. By Captain THOMAS BEST JERVIS, E. I. C. Engineers, F.R.S.

THE situation of this gulf at the extreme north-western limit or angle of the Malabar coast, and consequent accumulation of the head wave at flood tide, propelled, as it is, through a comparatively contracted channel, are the immediate causes of the singular influx of the tide described in Lieutenant Ethersey's paper. The Orinoko, the Indus, and the Ganges, present similar phenomena, though the height or head with which the bore rushes into these rivers is considerably modified by their respective situations, and the directions of their principal channels. The gulf of Cambay is, in point of fact, the great or common outlet of the whole of the waters of Gujarát, which are discharged by seven principal streams; the Sábarmatí, the Máhí, the D'hádar, the Nurbhuddá,* and Taptí, and on the Káthi-wár coast, the Bhádar or Góma river, and the Gailá, which are better known as the Dhólará and Bháónuggur rivers, these

* The orthography of the names of places is *not* according to the system usually adopted in this Journal.

being the great ports or towns on their banks where the cotton vessels usually take in cargo. The province of Gujarát, as defined in the geographical distribution of the Moghul empire, under the emperor Akbar, comprised the whole of Káthiwár; and the Hindús, at an earlier date, considered it variously, either as constituting part of Sauráshtrá (Súrat), or (Gurjara) Gujarát. The province, at present, however, is understood to comprehend those districts only, on either side of the gulf, which are dependent on the civil jurisdiction of Ahme'dábád, Khérá, Baróda, Broach, and Súrat, the remainder being distinguished as Káthiwár, and under separate authority. In this restricted sense the entire territory of Gujarát is, generally speaking, a completely dead level; insomuch, that the mountain-torrents which accumulate in the provinces of Rájputánah, Málwah, and Khándésh, immediately on its frontiers, have at different periods cut for themselves channels, of various breadth, depth, and direction, according to the force or quantity of the water which has fallen in particular seasons during the great periodical rains. Sometimes these have taken the direction of the main and ordinary channel, or, on occasions perhaps, of any unusual and continued fall of rain, some new course, according as artificial or local changes may have been favourable to such alteration. Such, in short, is the simple character of this natural drainage of a tract, composed, in most parts of a loose rich alluvial, in all others, of a deep, sandy, or mixed soil—resting on a remarkable calcareous formation, similar in all respects to that in the plains of Bengal and Bahár, and which is termed by the natives *Kankar*. The Bhádar and Gailá rise in the Gírnár mountains; the Sábarmatí, with its tributary streams, the Mhészvá, Wátrak, Síri, &c., in the A'rawallí hills; the Máhí river, on the eastern face of the Udeypúr range, which separates Hindústán from Gujarát; the Dhádar, Nurbhuddá, and Taptí, disemboguing into the gulf north of the Malacca banks, effect the entire drainage of the territories stretching west of the Rájpiplá hills. Of all these channels, the Nurbhuddá and Taptí can alone be considered as rivers, in other words, channels supplied by springs throughout a considerable extent of country, and flowing uninterruptedly during the year with greater or less depth and rapidity. The Sábarmatí and Máhí, which have a considerable breadth and depth from bank to bank, with respect to the country they traverse, may rather be termed great watercourses or drains, as there are so few springs in their whole course, and, indeed, in the entire surface which their tributary channels intersect, that they are almost completely dried up at intervals within three or four months after the periodical rains have ceased.

The obvious consequence of such drainage is to detach an

enormous quantity of alluvium and sand year after year, which, being propelled farther down the channel, would be carried out directly to sea were there no predisposing cause for its deposition. The progressive formation of the Malacca and Bhágwá banks is incidental to the deposition of silt brought down by those streams, and the opposing influx of the tide, conjointly with strong south-westerly gales. By such slow and gradual process the opposite shores of the gulf, as well as the intermediate channels of these deposits have been gradually contracted; to which cause the singular influx of the tide is principally to be attributed. About twenty-five years ago Colonel Monier Williams made a survey of the mouth of the Bhádar river and the neighbouring coast of Cambay (Kambáyét), since which a long spit of mud which projects several miles into the gulf has gradually been formed, and the main channel of the Sábarmatí has also been considerably contracted and altered. There is little reason to doubt that this continual accession of mud will still further contract the channel; though artificial aid and much science would be essentially necessary to the recovery of any such land for the purposes of agriculture. A careful examination of the revenue surveys of the Broach and Súrat Collectorates by Colonel Williams, and the vast accession of the richest lands observable on either bank of the Nurbhuddá, below Unklésur, and on the sea-coast of Súrat within the last two centuries, the period of the latest Moghul assessment, would lead us to conclude that a like process had been going on, time immemorial, in that curious tract called the Run, containing many hundred thousand square miles. Although volcanic agency is supposed to have been the immediate cause of this sinking in of the land, or, with equal probability, the uplifting of the original bed of a great backwater or inlet of the sea, the progressive deposition of silt, brought down by the streams which empty themselves into its bed, must have materially assisted such a change, and favoured further volcanic agency by additional superincumbent matter.

In March and April, 1816, I crossed the gulf from Cambay to Jambúsír, and thence to Gógeh or Gógó, and back to Cambay, and had an opportunity of witnessing the rushing influx of the bore, and observing its direct progress up the channel for several days with great advantage. I had a small schooner belonging to the Collector of Khéra, Colonel Archibald Robertson, of about thirty tons burthen, which was manned by sailors from Gógeh, a class of people who are remarkably courageous and expert at sea. The coolness and dexterity with which they secured and righted the vessel on the rush of the first wave is still fresh in my memory, and I remarked that in casting anchor every day, as the tide went out, when the vessel grounded in the mud, that the Tindál, or

THE Gulf of CAMBAY

Lengths East 72 30' from Greenwich.

Published for the Journal of the Royal Geographical Society by J. Murray London 1838.

master of the vessel, invariably took the precaution of selecting some spot in the direct line of its progress, that is, in the main channel, where, he said, there was less danger to be apprehended than in the neighbourhood of the shores, in consequence of the recoil or curl of the tide along shore, and the falling in of the loose banks. The bore appeared to set in like a straight wall of water with a head of five or six feet, each succeeding wave decreasing more and more, till the whole gulf was reduced to the same level with the sea without. We heard it approach several minutes before it came upon us, when we were fairly lifted up, and afloat in an instant. The shifting of the sand-banks, the gradual filling in of the rivers, and the formation of extensive bars at their entrances, render new surveys of the whole western coast continually necessary for the safety of the navigation to foreign vessels—but the most important service would be rendered to science by an exact registration of the tides, and observations of the gradual accession of land on the one, or detrition of land on the other coast of India; a service which the East India Company alone can originate and execute satisfactorily.

XV.—*Remarks on the supposed Situation of Minoa and Nisæa.*

By MR. T. SPRATT, of H.M.S. Beacon. Communicated by Captain BEAUFORT, Royal Navy, F.R.S., Corr. Inst. France.

THE fortress Minōa of the Megareans, which Thucydides* speaks of as an island, and Strabo† as a promontory or peninsula, appears to agree with a rocky hill surmounted by a ruined fortress, and standing on the margin of the sea south of Megāra, at the distance of little more than a geographic mile; thus agreeing with the distance given by Thucydides, who calls it about eight stadia.‡

That this hill was once a peninsula, appears evident from the dry beds of two rivers which pass close to its base; one on each side. The eastern bed winds round the back of the hill, leaving only a narrow neck of elevated ground between it and that on the west side: and it is therefore clear, that when these two rivers had communication with the sea, the intermediate neck of land, with this hill, would have been a peninsula, or promontory.

These two river-beds were once the only outlets of the moun-

* Thucyd. iii. 51.

† Beyond [i. e. east of] the rocks called Skironides, stretches out the point Minōa forming the port at Nisæa; but Nisæa is the harbour (or dock) of the Megarenses, eighteen [read "eight"] stadia distant from the city [of Megara], connected with it by "legs" [skelé, i. e. walls] on both sides. This port is also called Minōa. (Strabo, ix. pp. 391-2.)

‡ Thucyd. iv. 66.

tain streams which issue from the valleys on the north side of Mount Geranea; for the ancient course of the eastern bed, although now ploughed over and cultivated, can be traced through the plain to the northward as far as its junction with that river, whose torrent at present flows in an easterly direction towards the shallow bay of Tikho, crossing the site of the long walls which connected Megara with Nisæa and Minoa, and losing themselves in the swamps bordering that bay. Although vestiges of the walls are not found in the bed of the river, yet, on examining the ground near it, the evidence is convincing that its present course does cross their site, as at a short distance from it, on the Megarean side, their foundations may be traced in a direction transverse to the course of the river, and towards the castellated hill before mentioned.

The dry water course on the western side of this isolated hill can be traced to within two or three hundred yards of the eastern one, and having no communication with any other mountain stream, it may not be unreasonable to suppose that formerly the river split there into two branches or mouths. This hill would then have been an island, as Thucydides calls Minoa; and if it was so in his time, it is not more than probable that the subsequent deposit of earth brought down by this stream, during the four succeeding centuries, which elapsed between his time and that of Strabo, should have joined it to the main by a neck of land or isthmus. To accomplish this, no very great deposit was requisite, as the historian says* "the bridge of communication between Minoa and Nisæa was over a swamp, or morass." But to identify this hill still more clearly with the site of Minoa, it is necessary to discover near it the ruins of the town of Nisæa, which, it appears from Thucydides, was situated at the harbour formed by the island Minoa.

That any considerable remains of the many important edifices mentioned by Thucydides should now be found, cannot be expected, where there is such extensive evidence of the changes undergone in the neighbourhood from the action of the rivulets when swollen by the mountain floods in the rainy season. Indeed, from the level form and small elevation above the sea of the whole plain, it is very probable that the greater part of it is an alluvial deposit. Yet that a town, besides the fortress on the hill, was here, is evident from the many vestiges that are seen on its

* The island was *very* near the continent, for the expression "to the island not far distant from the continent" (Thucyd. iii. 51, near the end) certainly appears from the context to signify *less than a mile*.

The word translated marsh (*εἰςαγος*) signifies, according to the Greek lexicographers, "a wet muddy place; mire with a little water on the surface, and plants appearing on the water."

eastern side, between the sea and a low rock which stands in the plain a short distance to the northward. Among these remains are four small heaps of ruins with massive foundations, in one of which there are three broken shafts of small columns erect, and wanting apparently only the fourth to complete the original number. Probably they were monuments, or *temples*; * and two Greek churches, which are now in ruins, but standing on two ancient foundations, will not be unfavourable to the supposition. Another church, Agios Nicolaos, which is perfect, also occupies the site of an ancient building, but it stands nearer to the sea.

The wall built by Nicias,† the Athenian general, in order to prevent ingress or egress to or from Minoa by the bridge, was hastily thrown up, and it is therefore natural to suppose that it was not a work in which durability was studied; and, consequently, its entire disappearance does not weaken the conjecture that the above-mentioned ruins were those of Nisæa. On the other hand, the bridge of communication may well be supposed to have been of greater strength, and therefore likely to have some part still remaining. Now, between the base of the hill on its north side, and the opposite bank of the dry bed of a former river, there are three platforms of heavy buildings, one of which lies immediately at the foot of the hill, another on the edge of the opposite bank, and the third nearly central; and as the course of that former river-bed clearly and indisputably passes between them, it is more than probable that the bridge of communication may be recognised in these ruins; the general appearance of which in nowise militates against this supposition.

The extent and number of the ancient remains in this plain are, however, too great to be considered as all belonging to Minoa; and the fortified hill is equally inconsistent with the idea of the whole being Nisæa, for no mention is made of its having an acropolis, though such a conspicuous and important a strong-hold as this hill could not have remained unnoticed. A division, therefore, of these ruins, appears the only means of determining the site of either Minoa or Nisæa; and, in the first place, it may be assumed as almost conclusive evidence that the fortified hill was Minoa, and that the ruins in the plain are those of Nisæa, when we state that distinct remains of an ancient mole are to be seen extending from the south-eastern end of this hill, and curving to the eastward, so as to have formed a harbour between the hill and those ruins; for Strabo expressly says that the port of Nisæa was formed by the island or promontory of Minoa.‡

* Posidonium, Thucyd. iv. 118.

† Thucyd. iii.

‡ Strabo, ix. 391.

The fortress on the hill, which I shall now call *Minoa*, was originally built of courses of quadrangular blocks of limestone quarried from the hill on which it stands; but the greater part of the present ruins are of a more recent date, exhibiting no regularity in either the size or shape of the materials, and intermixed with travertine, and with a soft shelly sandstone often found in the *Morea* and in *Attica*. A high tower of the same style of building projects from the north wall, and being similar to those commonly erected by the Venetians, it may help to indicate that the repairs of the fortress were made at the time the country was in their possession.

Although there exists so much evidence in favour of the sites of *Minoa* and *Nisæa* being here, a few remarks on the adjacent coast may be satisfactory. At the distance of nearly half a mile to the eastward of these ruins, there is a small rocky peninsula, and further off two islands, the inner one of which affords shelter to a few of the small class of coasters. It has therefore been supposed, as this is a port of the *Megareans* of the present day, and formed by an island, that this island was *Minoa*.

That any encroachment either of the land or sea could have taken place, so as to alter the general features of the island or peninsula, is disproved by their rocky shores; for they both, as well as the ridge of hills from which the latter extends, are entirely of a limestone formation, which in its nature is extremely hard. No conjectured uplifting of the land, or fretting away of the coast, can therefore plausibly account for any difference in the locality of this place from the descriptions of *Thucydides* or *Strabo*. Now the inner island is distant from the promontory about two hundred yards, with seven fathoms water between them; they could not therefore have been connected by a bridge: nor was the peninsula ever an island, as its isthmus is of equal height with the extremity. Consequently, as both differ so materially from the descriptions of *Minoa*, in two points so necessary to determine its position, and as both are destitute of any remains of either a fortress or habitations, it must be sought for elsewhere.

The long range of hills that terminate in the promontory of *Tikho*,* and from the western end of which the little peninsula juts out, from its proximity to the ruins (supposing the whole of them to be *Nisæa*), might be assumed to be *Minoa*, because it also may have been at one time an island. But *Pausanias*,† who

* *Τύχος*? a fort.

† The passage in *Pausanias* (*Attic*. xliv.) is as follows:—

“And as they go down [from *Megara*] to the harbour, still called in our time *Nisæa*, they come to the Temple of *Ceres*, the sheep-bearer (*Ceres ovifera*, *Demeter malophora*). Any one might perceive that the roof [of the temple] has fallen

MINOA AND NISÆA

IN THE

GULF OF ÆGINA

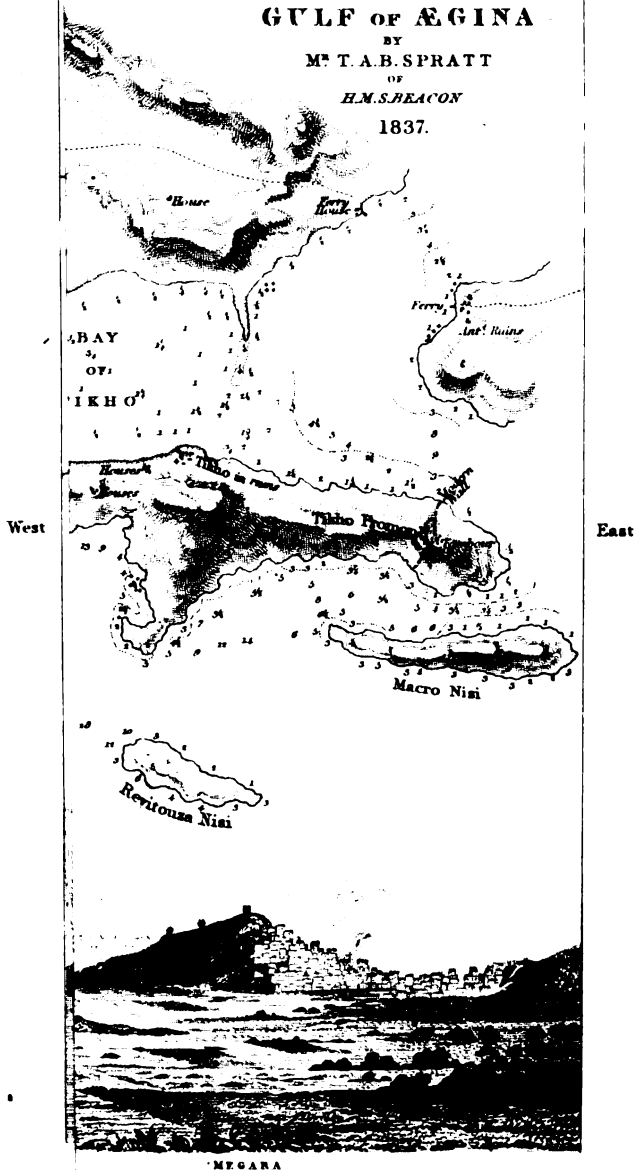
BY

M^r T. A. B. SPRATT

OF

H.M.S. BEACON

1837.



alone speaks of the relative magnitude of Minoa, calls it a *small* island, whereas this range of hills is three miles in length, and could never have been less as an island, for its lowest part, near the head of the bay of Tikho, is twenty-five feet above the level of the sea; the size of this ridge, therefore, as an island, is a strong objection to the supposition.

As the places described both before and after Minoa and Nisæa are found in succession in Strabo's description, it may perhaps be some guide towards fixing their situations to consider them in that order. First, Crommyon is described; then the Skironides rocks; next Minoa; afterwards Nisæa; the five islands follow; and Salamis after them. The promontory of Minoa in that case should be found between the Skironides rocks and Nisæa. This, then, will also be a good argument against the supposition of the long range of hills having been Minoa, for Nisæa would then have been a few stadia nearer the Skironides than to it; and had Nisæa been so situated, it appears likely that it would have been mentioned before Minoa. Besides, as no ruins remain on any part of the range to denote its ever possessing a fortress, the supposition has little to support it. There are, indeed, on each extremity, some portions of a modern wall of loose stones, perhaps for defensive works; and also a very perfect wall across the hill, from the bay of Tikho to the coast on the opposite side, but this was built by the Megareans during the late war. In short, there are no ruins of antiquity.

There is yet some difficulty in accounting for the five islands which Strabo says are passed in sailing from Nisæa towards Attica, before arriving at Salamis. The probability is that he included the islet which lies close off the south-west extremity of Salamis; but if that should not be admissible, and that we are thereby driven to suppose the above-mentioned long range of hills to have been an island when he wrote, then there is at once an end of the hypothesis that those hills were Minoa; for Minoa, *he says*, was a promontory.

in through lapse of time. There is also an *acropolis* there, itself in like manner called *Nisæa*. Near to Nisæa there is an island, not large, where Minos, in his war against Nisus, stationed the Cretan fleet."

The most accurate version of Thucydides is that by Hobbes; Dr. Bloomfield's, though his notes are useful to scholars, does not appear to be equal to Hobbes' in fidelity and closeness to the original.

XVI.—*On the Ground Ice or Frozen Soil of Siberia.* By Professor BAER. Communicated by Admiral KRUSENSTERN.
Read February, 1838.

It was remarked long ago that there is a large extent of country in Siberia where the soil never thaws. In summer, when the temperature is in some districts considerable, the ground becomes warm to a greater or less depth, and thawed, but lower down the ice is again met with. Gmelin, the elder, in his travels in Siberia, states that at Yakutsk, shortly after the foundation of that town, towards the end of the seventeenth century, the soil was found frozen at a depth of thirteen sashes, or ninety-one feet, so that the inhabitants were obliged to give up the idea of sinking a well. Many similar cases were brought forward by persons sent out by the Academy of Sciences of St. Petersburg about the middle of last century, but these do not appear to have been generally believed. In 1825 Leopold von Buch, a philosopher of high authority upon all questions relating to the physical condition of the earth, rejected them as erroneous; they have, however, been corroborated in our time by Erman and Humboldt.

In his paper published in the transactions of the Academy of Berlin, Von Buch says, "I am fully convinced that the accounts of the soil being frozen in summer to the depth of many feet, in districts capable of maintaining the growth of shrubs and bushes, are not to be relied on, and that Gmelin's statement that the soil was frozen in a well at Yakutsk at the depth of 100 feet, ought no longer to be quoted in elementary works upon natural philosophy. The accounts given by the Cossacks, who in all probability did not like the labour of sinking the well at Yakutsk, and who were dead before Gmelin extracted the information from reports at Yakutsk, cannot be sufficient proof of a fact so extraordinary and so much at variance with physical science. In Hudson's Bay, where the average degree of temperature is much below the freezing point, there are springs which run under a crust of snow and ice all through the winter." (*Captain James*, 1631; *Memoirs of the Royal Academy of Berlin*, 1825.)

The objections of this philosopher are founded partly on his opinion that cold cannot penetrate so far under the surface, and partly on the story of the springs at Hudson's Bay flowing the whole year round; but if this statement is correct, may not these springs, flowing from under the ice, be thermal springs? Other persons have questioned the existence of perpetual ice in Siberia, as being in direct opposition to the modern experiments, which show that the heat of the earth increases directly as the distance from the surface. It was not known till very lately how deep the

frozen bed extended: for the first information on this subject we are indebted to a merchant of Yakutsk, of the name of Schargin, who carried on an experiment for several years for this purpose. His object at the beginning was to sink a well, but when there was no longer any chance of getting water, and he was about to discontinue his work, Admiral von Wrangel requested him to go on until he reached the bottom of the ice: he did this, and kept a journal of the progress of the work, which he sent to the admiral, and a communication to the Academy of Sciences respecting it was made by M. von Helmersen.

The well was sunk to a depth of 54 sashes, or 382 feet, when the soil became so loose that it was impossible to proceed without timbering, which had been unnecessary nearer the surface. At this depth M. Schargin ascertained the temperature of the earth to be $- \frac{1}{2}^{\circ}$ Réaumur, but nearer the surface it had been much lower:—

— 6° Réaumur at some feet below the surface.	
— $5\frac{1}{2}^{\circ}$ R. at 77 feet.	— $1\frac{1}{2}^{\circ}$ R. at 305 feet.
— 4° " 119 "	— $\frac{1}{2}^{\circ}$ " 350 "
— 2° " 217 "	— $\frac{1}{4}^{\circ}$ " 382 "

It is probable on looking at this table that in the last observation a greater degree of cold is assigned to the ground than it really has. Besides, as the work was carried on in winter as well as summer, and the mouth of the pit was eight feet square, so large a volume of cold air must have penetrated as to chill the sides—I am therefore inclined to believe that the freezing point must have been reached. The immense thickness of the layer of ground ice (which at Yakutsk is not less than 382 feet) proves that Siberia must have been in the same physical condition for a long period of years as it is at present.

It is impossible to determine accurately, in the present state of our information on this subject, what is the boundary of this layer of ground ice; we only know enough to say that it extends over an immense tract of country. Humboldt found the soil frozen at a depth of six feet at Bogoslovsk, in $59^{\circ} 44'$ N. lat., near the Uralian chain. Near Beresov, Erman found the temperature of the soil, at a depth of twenty-three English feet, to be $+ 1^{\circ}$; but in 1821 a dead body was found which had been buried upwards of ninety-two years in a bed of ground ice, and which showed no signs of decomposition. It has long been known that the soil at Obdorsk, a town situated some degrees further north, is always frozen. There is no ice at Tobolsk, but the further we proceed to the east the more the direction of the ice is to the south. Georgi found it on the banks of Lake Baikal, which, however, is in a mountainous country, and it is said to be found east at Nertchinsk, on the banks of the river Argún, but here also in an ele-

vated tract of country. No ice is found at Okhotsk, and the soil is in general warmer on the shores of the Pacific.

The ice, of course, melts more or less every summer, in proportion to the greater or less degree of heat, but old authors assert that the warmth has only the effect of thawing the surface: this is a mistake, which arises from the measurements having been taken at too early a period of the summer, and having then been looked on as the mean of the effect of the heat during the summer months, and as the greatest depth to which the heat penetrated. I have seen ice at a depth of six inches under a soil covered with moss and lichens in the month of July at Novaia Zemlia, whilst in a contiguous situation, where the soil is without any signs of vegetable life, it occurs at a depth of two feet. But when winter recommences, which is generally about the beginning of September, the soil in the southern division of Novaia Zemlia is thawed to the depth of $2\frac{1}{4}$ to $2\frac{3}{4}$ feet, and it may be true that the soil on the coasts of the Icy Sea, at the mouths of the rivers Obi and Yenisei, is sometimes free from ice to more than a foot in depth, and the surface is covered with vegetation.

I have no doubt that the Academy of Sciences at St. Petersburg will repeat the measurements of temperature at the different depths in a better manner and on better principles than M. Schargin could adopt, and endeavour to ascertain the depth to which the heat penetrates at Yakutsk as well as in other places, and also the extent of the ground ice.

It would be very desirable, also, that the Geographical Society of London should collect information respecting the extent of the layer of ground ice in North America, the thickness it attains, and how much of it disappears, particularly in those countries over which the factories of the Hudson's Bay Company extend.

As connected with the same subject, the following extract from a letter of Prof. ADOLPH ERMAN, dated Berlin, March 5, 1838, is subjoined:—

“I see by a report recently published of one of your meetings that some members doubt the reality of the fact that the soil in some parts of Siberia does not thaw till a depth of 400 feet from the surface is reached. Permit me to draw your attention to the observations I have made on this subject, recorded in the Second Volume of my Journey round the World, p. 248, *et seq.* The well at Yakutsk, a notice of which Admiral Krusenstern has sent you, existed when I was in that town; it had then a depth of 50 feet, and in plunging my thermometers into the clods of earth which were dug up before me, and guarding them carefully from the influence of atmospheric temperature, they constantly marked -6° of Réaumur.

“The latitude of the place, however, is only $62^{\circ} 1\frac{1}{2}'$ N., according to the result of all my observations; a mean temperature, therefore, even

lower than that which Mr. Scoresby assigns to the north of Spitzbergen, might well surprise me until I had seen it perfectly established by observations on the temperature of the air which were made during several consecutive years, and with thermometers compared with my own.

"I enclose the observations taken three times a day for the year 1827, whence it results that the mean temperature of the atmosphere at Yakutsk is $-5^{\circ}.9$ Réaumur, which agrees very well with the temperature which I had found near the surface of the ground.

"I may remark that I have selected a *temperate winter*, for in 1828 the cold in the month of January was much more severe, as the mean of the observation then gave

	At 6 A. M.	2 P. M.	9 P. M.
January, 1838	$-38^{\circ}.3$	$-35^{\circ}.7$	-37°

and the mercury did not thaw for *three months together*: in ordinary years it is only solid for two months.

"Now the mean temperature of Yakutsk being -6° , it follows necessarily that if we dig deeper into the earth we must not expect to find the ground thawed till the increment of heat due to the approach towards the centre should amount to 6° of Réaumur.

"The *data* which we hitherto possessed on the increase of the internal heat of the globe, and which have been collected together by Mr. Delabeche in his excellent treatise on Geognosy, indicated from 90 to 100 French feet for an increase of 1° of Réaumur; I did not therefore expect to find the ground thawed at Yakutsk until at a depth of from 500 to 600 French feet (see p. 251 of vol. ii.), and if the actual fact of a thaw at the depth of 400 feet has surprised me, it is only because it has occurred *too soon*; and that it thereby indicates for the strata that compose the ground at Yakutsk a greater faculty for conducting heat than is possessed by the strata hitherto examined in Europe."

XVII.—*An Account of the Recent Arctic Discoveries by Messrs.*

DEASE and T. SIMPSON. Communicated by J. H. PELLY, Esq., Governor of the Hudson's Bay Company.

[Just half a century has elapsed since Alexander Mackenzie, in 1789, first descended the great river which so justly bears his name, and reached the waters of the Polar Sea. Thirty-seven years later, in 1826, Franklin and Back followed Mackenzie's course to the mouth of the same river, and coasted 370 miles to the westward, tracing the northern shore of America till within 160 miles of Point Barrow, which was reached from the westward by Mr. Elson, Master of H.M.S. Blossom, only four days after Franklin was obliged to return. The intermediate portion has remained a blank on our maps till the last few days have brought us the gratifying intelligence of an expedition headed by Messrs. Dease and Simpson, two enterprising officers in the Hudson's Bay Company's service, having successfully traced the unexplored country between Point Barrow and Franklin's farthest; and thus a continuous line of 60 degrees in extent, of the northern coast of America, from Point

Turnagain on the east to Behring's Strait on the west, has been explored by British hardihood and perseverance. The only account of it yet received is contained in the simple narrative of the gentlemen who conducted this expedition, which was with much kindness immediately communicated to the Geographical Society by the Governor of the Hudson's Bay Company.]

Fort Norman, 5th September, 1837.

HONOURABLE SIRs,—We have now the honour to report the complete success of the expedition this summer to the westward of Mackenzie's River.

Our arrangements up to the departure of the expedition from Fort Chipewyan were stated in full to Governor Simpson and the Northern Council, who, no doubt, communicated them to your Honours; we shall, therefore, present a brief detail of our subsequent operations.

On the 1st June we quitted Fort Chipewyan, with two small sea-boats, accompanied by a luggage-boat and a party of hunters, for Great Bear Lake; visited the salt plains, and arrived at Great Slave Lake on the 10th, where we were detained by ice until the 21st. The same cause prolonged our passage across that inland sea, and, having been for two days stopped by a strong contrary wind at the head of Mackenzie's River, it was the 1st July when we reached Fort Norman. Our Indians cast up on the following day, and the crews and cargoes were finally divided and arranged. Our boat-builder, John Ritch, received his instructions to proceed immediately, with a fisherman, two other labourers, and the hunters, to Great Bear Lake, and at its north-eastern extremity to erect our winter-quarters, and lay in a stock of provisions against our return from the coast. We then took our departure, and on the 4th reached Fort Good Hope. There we found an assemblage of Hare Indians and Loucheux. The latter informed us that three of their tribe had been killed and a fourth severely wounded by the Esquimaux in the preceding month, which at once put an end to our intention of procuring an interpreter from among them, although several volunteered to accompany us in that capacity. They at the same time earnestly cautioned us to beware of the treacherous arts of their enemies. On the 9th July we reached the ocean by the most westerly mouth of the Mackenzie, which Sir John Franklin sought for in vain. It is situated in lat. $68^{\circ} 49\frac{1}{2}'$ N., long. $136^{\circ} 37'$ W., and perfectly answers the description which the Esquimaux messengers gave of it to that officer when they came to apprise him of the intended attack by the Mountain Indians.

We had proceeded but a short distance to seaward, when a party of nineteen men came off to us from Tent Island. We gave each of them a small present, a practice which we continued

throughout the voyage, and employed our vocabularies to the best of our ability, and to their great surprise, to explain the friendly feeling of the whites towards their tribe. Being a lively and communicative people, we in the course of the season acquired some facility in our intercourse with them, and when words failed, signs supplied their place, so that we seldom experienced much difficulty in making ourselves understood, or in comprehending their meaning. When indulged, however, they always became daring and excessively troublesome, and they were ever on the look-out for plunder. On this first meeting they made several unsuccessful attempts in that way, and it was no easy matter to induce them to return to their camp, after we had finished our business with them. They said they wished to accompany us to our encampment, where they would have soon been joined by fresh parties, and we had a shoal and dangerous navigation before us that night. We therefore peremptorily ordered them back; but it was not until we fired a ball over their heads that they put about and paddled off. A storm soon after arose, but we made the land in safety the following morning at Shingle Point, in lat. 69° , where we were detained until the 11th. The thermometer had already fallen to 48° (Fahr.), being 30° lower than on the evening we left the Mackenzie River, and, instead of the bright and beautiful weather we enjoyed in our descent of that noble stream, we were now doomed to travel in cold dense fogs, which enveloped us during nearly the whole of our progress along the coast. But although they perplexed and retarded us, we never allowed them to arrest our course, nor did we ever throughout the voyage encamp but when compelled to do so by ice or contrary winds, to which line of conduct may, under Providence, be ascribed the early and successful accomplishment of our undertaking. In the afternoon of the 11th July we reached Point Key, where we were detained by a compact body of ice occupying Phillip's Bay until the 14th. There we were visited by another party of Esquimaux, whose tents were pitched at no great distance from us. They live in the country bordering on Babbage River, and informed us that, except when flooded by the melting of the mountain snows, it is an insignificant stream, not fifty yards in breadth: of this we had ocular proof in a clear day on our return. A handsome flora was collected in this neighbourhood. Having found a passage through the ice in Phillip's Bay, we reached Herschel Island the same evening (14th July), and had intercourse with other parties of the natives, who were pretty numerous along this part of the coast. We found on the island the skull of a whale eight feet in breadth; and whalebone is everywhere an article in extensive use among the natives, especially for the making of their nets and the fastenings of their sledges. We continued our route before

an easterly wind, along and through the ice, with very little interruption till two A.M. of the 17th, when an unbroken pack, extending to seaward, made us seek the shore in Camden Bay, near a considerable camp of Esquimaux. As soon as the fears of the latter were removed, an amicable meeting took place, and, having made them the usual presents, we purchased a good many of their mouth ornaments, weapons, and other articles, which will be forwarded in due course to the Hudson Bay House. Three of the men were remarkable for their good looks, upright figures, and a stature of from five feet ten to six feet. They gave us a specimen of their dances, and one of them afterwards won the palm from all our people at leaping. They informed us that they have two sources of trade; the first and most regular with their countrymen, who come annually from the westward; the other with the Mountain Indians, who use fire-arms, and travel a great way across land from the direction of the Russian settlements. They showed us the knives, iron kettles, beads, and other things thus procured, which we have no doubt are of Russian manufacture. Their means of repayment appeared to us very limited, consisting in seal-skins, whalebone, ivory, and a few inferior furs, viz., wol-vereens, foxes, and musk-rats. A pair of indifferent beaver gloves was purchased from them, which they had probably procured from the Mountain Indians, for we saw no other symptom of the existence of that valuable animal near the coast, though it doubtless abounds at some distance up the large wooded rivers which we subsequently discovered. In the afternoon there appeared a narrow lane of water stretching outwards, and we immediately embarked. We had advanced about three miles from the land, when the ice suddenly closed upon us, before a strong north-east wind; one of the boats got squeezed, and it was only by throwing out the cargo upon the floating masses that she was saved from destruction. By means of portages made from one piece to another—the oars serving as bridges—the cargo was all recovered, and both boats finally hauled up on a large floe, where we passed an inclement and anxious night. Next morning the gale abated, the ice relaxed a little around us, and by a long circuit we regained the shore, about a league to the eastward of our former position. There we were detained till midnight of the 19th, when a favourable wind enabled us to round the body of ice at a distance of four miles from the land, and, continuing, carried us on the 20th into Foggy Island Bay. There we were stopped by the ice and a violent north-east wind until the 23rd, having on the preceding day made an ineffectual attempt to weather Point Anxiety, in which we narrowly escaped with a thorough drenching. The latitude ashore was $70^{\circ} 10'$. From this situation we had the satisfaction of discovering, during a clear afternoon, a range of

the rocky mountains to the westward of the Romanzoff chain, and not seen by Sir John Franklin, but, being within the limit of his survey, we called it the "Franklin Range," as a just tribute to his character and merits. On the 23rd we again set sail, rounded the pack of ice, which extended six miles to seaward from Yarrow Inlet, then, abruptly turning in, we supped near Return Reef, and the survey commenced.

Return Reef is one of a chain of reefs and islets which runs for twenty miles parallel to the coast, at the distance of about half a league, affording water enough within for such light craft as ours. The mainland is very low. From "Point Berens" to "Cape Halkett" (named after two members of your Honourable Board) it forms a great bay, fifty miles broad by a third of that depth, which in honour of the Deputy-Governor was named "Harrison's Bay." At the bottom of this bay another picturesque branch of the Rocky Mountain range—the last seen by us—rears its lofty peaks above these flat shores: we called them "Pelly's Mountains," in honour of the Governor of the Company. At their base flows a large river, two miles broad at its mouth, which we named after Andrew Colville, Esq. This river freshens the water for many miles, and its alluvial deposits have rendered Harrison's Bay so shallow, that it was not till after a run of twenty-five hours, during which we had repeatedly to stand well out to seaward, that we could effect a landing on a grounded iceberg, nine miles to the south-west of Cape Halkett. A north-east gale kept us there the whole of the following day. The country extending to the foot of the mountains appeared to consist of plains covered with short grass and moss, the favourite pasture of the reindeer, of which we saw numerous herds. Observations were obtained, determining our position to be in lat. $70^{\circ} 43' N.$, long. $152^{\circ} 14' W.$; variation of the compass $43^{\circ} E.$ Next morning (26th July) the tide rose nearly two feet at six A.M., and enabled us safely to cross the shoals. At no great distance from our encampment we passed the mouth of another large river, one mile broad, whose banks were thickly lined with drift timber. We named it the "Garry," in honour of Nicholas Garry, Esq. Cape Halkett forms the extreme point of a small island, separated from the main shores by a narrow channel too shallow for boats. Its situation was likewise found by observation to be in lat. $70^{\circ} 48' N.$, long. $151^{\circ} 55' W.$ It appears to be a place of resort to the Esquimaux, for we found a spot where they had been building their baidars last spring. We suppose them to have been part of a very large camp, which we saw in the bay of Staines River, as we sailed past the east end of Flaxman Island on the 20th July; that this camp consisted of the western traders of that tribe on their annual journey to meet their eastern

brethren at Barter Island; and that we missed them on our return, from the circumstance of their being then dispersed along the rivers, lakes, and in the skirts of the mountains, hunting the reindeer.

From thence the coast turned suddenly off to the W.N.W. It presented nothing to the eye but a succession of low banks of frozen mud. The ice was heavy all along, but there were narrow channels close to the shore; the soundings on these averaged one fathom on sandy bottom. In the evening we passed the mouth of a considerable river, which was named after William Smith, Esq. From thence, for about six miles, the coast-line is formed of gravel reefs, near the extremity of which, at "Point Pitt," (called after another member of your Honourable Board,) the land trends more to the westward. The ice lay much closer here; numerous masses adhered to the bottom under the water, which obliged us to search for a passage out from the shore. The night was dark and stormy, and we were in considerable danger; one of the rudders gave way, but we at length effected a landing on a place near an immense reindeer pound. This was ingeniously formed by the Esquimaux with double rows of turf, set up on a ridge of ground enclosing a hollow four miles by two, the end farthest from the beach terminating in a lake, into which the unsuspecting animals are driven and there despatched with spears. The vegetable soil in this vicinity was barely four inches in depth, beneath which the clay was frozen as hard as rock, so that our tent pickets could not be driven home. The men had to go a good mile to find a log or two of drift-wood for fuel, the scarcity of which essential article is doubtless the chief cause of the want of inhabitants along so great a portion of the coast. We were detained at this place till the following afternoon (27th), when the ice opening a little enabled us to resume our route. It blew a cutting blast from the north-east, and the salt water froze upon the oars and rigging. "Point Drew," called after Richard Drew, Esq., seven miles distant from our last encampment, is the commencement of a bay of considerable size, but extremely shallow, and much encumbered with ice, in pushing through which the boats received several blows; and we had on this, as on many other occasions, to admire their excellent workmanship. To seaward the ice was still smooth and solid as in the depth of a sunless winter. At midnight we reached a narrow projecting point, across which the peaks of some high icebergs appeared, and were from a distance mistaken for lodges of the natives. This point we named "Cape George Simpson," as a mark of respect for our worthy governor. It was destined to be the limit of our boat navigation, for during the four following days we were only able to advance as many miles. The weather was foggy and dismally

cold, the wild fowl passed in long flights to the westward, and there seemed little prospect of our being able to reach Point Barrow by water. "Boat Extreme" is situated in lat. $71^{\circ} 3' N.$, long. $154^{\circ} 26' W.$; variation of the compass, $42^{\circ} E.$

Under the above circumstances Mr. Thomas Simpson undertook to complete the journey on foot, and accordingly started on the 1st of August with a party of five men. They carried with them their arms, some ammunition, pemmican, a small oiled canvas canoe for the crossing of rivers, the necessary astronomical instruments, and a few trinkets for the natives. It was one of the worst days of the whole season, and the fog was so dense that the pedestrians were under the necessity of rigidly following the tortuous outline of the coast, which for twenty miles formed a sort of irregular inland bay, (being guarded without by a series of gravel reefs,) the shore of which was almost on a level with the water, and intersected by innumerable salt creeks, through which they waded, besides three considerable rivers or inlets, which they traversed in their portable canoe. They found at one place a great many large wooden sledges, joined with whalebone and strongly shod with horn. Mr. Simpson conjectures that these vehicles were left there by the western Esquimaux, already spoken of, on their eastward journey, to be resumed again on their return when winter sets in. The tracks of reindeer were everywhere numerous. Next day the weather improved, and at noon the latitude $71^{\circ} 10'$ was observed. The land now inclined to the south-west, and continued very low, muddy, and, as on the preceding day, abounding in salt creeks whose waters were at the freezing temperature. The party had proceeded about ten miles when to their dismay the coast suddenly turned off to the southward, forming an inlet extending as far as the eye could reach; at the same moment they descried, at no great distance, a small camp of the western Esquimaux, to which they immediately directed their steps. The men were absent hunting, and the women and children took to their boats in the greatest alarm, leaving behind them an infirm man, who was in an agony of fear. A few words of friendship removed his apprehensions and brought back the fugitives, who were equally surprised and delighted to behold white men. They set before the party fresh reindeer meat and seal-oil, and besought them for tobacco (*tawāccah*), of which men, women, and even children are inordinately fond. Mr. Simpson now determined to adopt a more expeditious mode of travelling, and applied for the loan of one of their "oomiaks" or family canoes, to convey the party to Point Barrow, with which, from a chart drawn by one of the most intelligent of the women, it appeared that these people were acquainted. The request was

immediately complied with; four oars were fitted with lashings to this strange craft, and the ladies declared that our party were true Esquimaux and not "Kabloonan." Before starting the hunters arrived, and were likewise gratified with tobacco, awls, buttons, and other trifles. "Dease's Inlet" is five miles broad at this place, yet so low is the land that the one shore is just visible from the other in the clearest weather. It now again blew strongly from the north-east, bringing back the cold dense fog, but the traverse was effected by aid of the compass. The waves ran high, and the skin boat surmounted them with a buoyancy which far surpassed that of our boasted north canoes. The party encamped on the west side of the inlet. The banks there were of frozen mud ten or twelve feet high; the country within was perfectly flat, abounded in small lakes, and produced a very short grass, but nowhere had the thaw penetrated more than two inches beneath the surface, while under water along the shore the bottom was still impenetrably frozen. Not a log of wood was to be found in this land of desolation, but our party followed the example of the natives, and made their fire of the roots of the dwarf-willow in a little chimney of turf. Next morning (August 3rd) the fog cleared for a while, but it was still bitterly cold, and the swell beat high on the outside of a heavy line of ice which lay packed upon the shore. The latter, after extending five miles to the northward, turned off to the north-west, beyond which the latitude $71^{\circ} 13'$ was observed. From this point the coast trended more westerly for ten miles, until the party came to what appeared a large bay, where they stopped for two or three hours to await the dispersion of the fog, not knowing which way to steer. In the evening their wish was gratified, and from that time the weather became comparatively fine. The bay was now ascertained to be only four miles in width: the depth half way across was one fathom and a half on a bottom of sand; that of Dease's Inlet was afterwards found to be two fathoms, muddy bottom, being the greatest depth between Return Reef and Point Barrow, except at ten miles south-east from Cape Halkett, where three fathoms on sand were sounded on our return. After crossing "Mackenzie's Bay" the coast again trended for eight or nine miles to the W.N.W. A compact body of ice extended all along and beyond the reach of vision to seaward; but the party carried their light vessel within that formidable barrier and made their way through the narrow channels close to the shore. At midnight they passed the mouth of a fine deep river, a quarter of a mile wide, to which Mr. Simpson gave the name of "The Belle Vue," and in less than an hour afterwards the rising sun gratified him with the view of Point Barrow stretching out to the N.N.W.

They soon crossed Elson Bay, (which in the perfect calm had acquired a coating of young ice,) but had no small difficulty in making their way through a broad and heavy pack that rested upon the shore. On reaching it, and seeing the ocean extending away to the southward on the opposite side of the Point, they hoisted their flag, and with three cheers took possession of their discoveries in his Majesty's name.

Point Barrow is a long low spit, composed of gravel and coarse sand, which the pressure of the ice has forced up into numerous mounds, that, viewed from a distance, assume the appearance of huge boulder rocks. At the spot where the party landed it is only a quarter of a mile across, but is broader towards its termination. The first object that presented itself on looking round the landing-place was an immense cemetery. The bodies lay exposed in the most horrible and disgusting manner, and many of them appeared so fresh that some of the men became alarmed that the cholera or some other dreadful disease was raging among the natives. Two considerable camps of the latter stood at no great distance on the Point, but none of the inmates ventured to approach till our party first visited them, and with the customary expressions of friendship dissipated their apprehensions. A brisk traffic then commenced, after which the women formed a circle and danced to a variety of airs, some of which were pleasing to the ear. The whole conduct of these people was friendly in the extreme; they seemed to be well acquainted with the character if not the persons of white men, were passionately fond of tobacco, and when any of the younger people were too forward, the seniors restrained them, using the French phrase "*c'est assez*," which, like "*tawâccah*," they must have learned from the Russian traders. They designate the latter "*Noonatagmun*," and a respectable looking old man readily took charge of a letter addressed by Mr. Simpson to them or to any other whites on the western coast, containing a brief notice of the proceedings of the expedition. To the northward enormous icebergs covered the ocean, but on the western side there was a fine open channel, which the Esquimaux assured the party extended all along to the southward; and so inviting was the prospect in that direction that, had such been his object, Mr. Simpson would not have hesitated a moment to prosecute the voyage to Cook's Inlet in his skin canoe. The natives informed him that whales were numerous to the northward of the Point, and seals were everywhere sporting among the ice. These Esquimaux were well clothed in seal and reindeer skins; the men all used mouth ornaments, and the "*tonsure*" on the crown of the head was universal among both men and boys; the women had their chins tattooed, but did not wear the lofty top-knots of

hair which are fashionable to the eastward. They were very inquisitive about the names of our party, and equally communicative of their own. A number of their words were taken down, some of which are different from the corresponding terms given by Sir Edward Parry, but the greater part are either the same or dissimilar only in their terminations. They lay their dead on the ground, with their heads all turned to the north. There was nothing else either in their manners or habits remarked as differing from the well-known characteristics of the tribe, except an ingenious and novel contrivance for capturing wild fowl. It consists of six small perforated ivory balls attached separately to cords of sinew three feet long, the ends of which being tied together, an expanding sling is thus formed, which, dexterously thrown up at the birds as they fly past, entangles and brings them to the ground.

Mr. Simpson could not learn that there had been any unusual mortality among this part of the tribe, and is of opinion that the concourse of natives who frequent Point Barrow at different periods of the year, coupled with the coldness of the climate, sufficiently account for the numerous remains already noticed. It was high water between one and two o'clock A.M. and P.M.; the rise of the tide was fourteen inches; and the flood came from the westward. Observations were obtained which determined the position of the landing-place to be in lat. $71^{\circ} 23\frac{1}{2}'$ N., long. $156^{\circ} 20'$ W., agreeing closely with the observations of Mr. Elson. Then, bidding adieu to their good-humoured and admiring entertainers, the party set out on their return. They were arrested that evening by the ice, but next morning (August 5) it opened and allowed them to proceed. At a late hour they reached the camp of the Esquimaux in Dease's Inlet, and, after liberally recompensing them for the loan of their canoe, directed some of the men to follow to Boat Extreme, where it would be left for them. Then continuing their route all night, at five A.M. on the 6th the party rejoined the main body of the expedition.

We commenced our return the same afternoon, and, being favoured by a light wind and an almost open sea, we sailed all night, and next day (Aug. 7) at noon reached Cape Halkett. We then steered across Harrison's Bay: the wind increasing to a gale we shipped much water, but persevering, under treble-reefed sails, at three P.M. of the 8th we landed safely at "Fawn River," within view of the point where our survey commenced. The position of this encampment was ascertained by good observations to be in lat. $70^{\circ} 25'$ N., long. $148^{\circ} 25'$ W. The gale having moderated we re-embarked the following afternoon, and, running without intermission before a fresh breeze, we

reached Demarcation Point to breakfast on the 11th. Several showers of snow fell during this run, and it was piercingly cold. The Romanzoff and British mountains had assumed the early livery of another winter. The ice in Camden Bay was still very heavy, but it protected us from the dangerous swell to which we became exposed after passing Barter Island. Soon after leaving Demarcation Point the ice became so closely wedged that we could no longer pursue our way through it. The following day (August 12) it opened a little, and the weather becoming fine we put out and advanced for a few hours, when the mountainous swell and heavy ice obliged us to seek the shore, which we reached with some difficulty between Backhouse River and Mount Conybeare. There we were detained until the 15th. The icebergs which begirt the coast were of great size, and of every imaginable shape, but from the summit of a hill, six miles in-land, we had an unbounded prospect of the blue ocean stretching to the north. The pasture in the deep valleys among the mountains was luxuriant; herds of reindeer were browsing there, and we procured some venison. In the night of the 14th the stars and aurora borealis were first visible. The following morning we resumed our route, and the weather continuing nearly calm we reached the western mouth of the Mackenzie on the 17th, and there encamped. The first Eskimaux seen during our return from Boat Extreme were at Beaufort Bay, but from thence to the vicinity of the Mackenzie we were continually falling in with small parties, many of whom we had seen on the outward voyage. We maintained a friendly intercourse with them all, and they were very anxious to know whether we were soon to visit them again. The habitations on Tent Island were abandoned in consequence, we understood, of an alarm that the Loucheux meditated a descent to revenge the murder of their friends.

We have but few general remarks to add to the foregoing narrative. The tides all along the coast were semi-diurnal; the flood coming from the westward. The rise, however, was strongly affected by the winds and ice; and our opportunities of observing were but few. At Boat Extreme the average rise was fifteen inches; high water from one and to two o'clock, A.M. and P.M. The rise generally decreased to the eastward, and at Point Kay it was only eight or nine inches. That the main sea is clear and navigable by ships during the summer months the long rolling swell we encountered on our return, and the view obtained from the mountains, furnish tolerable proof. We likewise saw some whales on our return. The prevalence of east and north-east winds during the early part of the summer is a remarkable fact. We were indeed favoured by a westerly wind for five days on our

return, but this was almost the only exception. At a more advanced period of the season, however, the winds blew more from the west and north-west. It is now certain that from Kotzebue's Sound to Cape Parry there is not a harbour into which a ship can safely enter, but it must be a very unpropitious season that would not admit of achieving that portion of the Arctic navigation; and another year ought certainly to suffice for the remainder, whether the voyage were commenced from Barrow's or from Behring's Strait. On this subject, however, we shall be better able to offer an opinion if successful in our next summer's operations.

The natural history of the coast from Return Reef to Point Barrow is meagre in the extreme. In the botanical kingdom scarcely a flower or moss was obtained in addition to the collection made on other parts of the coast. In zoology, reindeer, arctic foxes, one or two limmings, seals, white owls, snow buntings, grouse (*Lagopus salicite et rupestres*), and various well-known species of water-fowl, were the only objects met with; while in the mineralogical department there was not a rock *in situ* or boulder-stone found along an extent of more than two hundred miles of coast. The variation of the compass was found to have increased from one to three degrees at the corresponding points where observations had been made by Sir John Franklin. At Boat Extreme, on the other hand, it was only twenty-one minutes greater than that stated by Mr. Elson at Point Barrow, where, by continuing the proportion, the quantities would coincide. The moon was never once visible during the whole outward and homeward voyage, till our return to the western mouth of Mackenzie, where a set of distances was obtained, and the longitudes of the other points reduced back from thence by means of a very valuable watch generously lent to the expedition by Chief Factor Smith.

The map of our discoveries will be prepared and transmitted to your Honours in the spring.

Our ascent of the Mackenzie has not been characterised by any circumstance of particular interest. The weather continued calm and beautiful; and the journey was performed entirely by towing, in which manner we advanced at the rate of from thirty to forty miles a-day. The river has fallen very low, and the fisheries have, in consequence, been unproductive, causing a scarcity of provisions both at Fort Good Hope and among the natives. We saw a good many of the Loucheux, but the Hare Indians were all dispersed in the interior, searching for subsistence. From the coast up to Point Separation moose-deer were numerous—being quite undisturbed, but from our first falling in with the

[illegible]

Sohn Antonovich

Loucheux no vestiges of either moose or reindeer have been seen. We reached this place yesterday with half of our summer's stock of provisions still forthcoming, and are now awaiting with impatience the arrival of our outfit and despatches.

Some Indians from Great Bear Lake have brought us intelligence of the party sent to establish our winter-quarters. They were stopped in Bear Lake river by ice during the whole month of July, lost one of their canoes, and it was not till about the 6th ultimo that they passed Fort Franklin, after which they had the prospect of an unimpeded passage across the lake. The continued easterly winds were the cause of this vexatious detention, during which the Dogribs kindly supported our people with the produce of their nets.

Sept. 8.—We have this morning received Governor Simpson's letter, dated London, 11th November last, and have to offer our lively acknowledgments to your Honours for the interest you have been pleased to express in the success of the expedition, and in the welfare of ourselves and party.

We have duly received the journals of Captain Back's last expedition, and are glad to find that his new undertaking is in no way to interfere with our original instructions.

Your Honours may rest assured that our efforts in the cause of discovery and science next summer, to the eastward of the Coppermine river, will not be less zealous than they have this season been in another field, and we are sanguine in the hope that they will be crowned with equal success.

Our supplies for next season have come to hand. They were delivered in very indifferent order at Portage la Loche, and there was a considerable deficiency in the weights of the pemmican; but with the quantity saved of this year's stock there will be provision enough for next summer's operations, and we have no further demands to make upon the Dépôt for goods.

We send two men express to Great Slave Lake with this despatch, and to meet the spring packet, the non-arrival of which causes us some anxiety; and to-morrow we take our departure for winter-quarters.

We are, &c.

PETER W. DEASE
THOMAS SIMPSON

*The Governor, Deputy Governor,
and Committee of the
Honourable the Hudson's Bay Company, London.*

XVIII.—*Heights obtained during the Campaign to Kōstantīnah, in September, 1837.* By Monsieur DE FALBE, Captain in the Danish Royal Navy, late Consul General at Tunis and at Athens. Communicated by Sir GRENVILLE T. TEMPLE, Bart.

As a valuable supplement to the account of his journey from Bónah to Kōstantīnah, inserted at p. 39 of this volume, Sir G. Temple has transmitted the following table of elevations obtained by M. de Falbe, who has kindly sanctioned their being published in the *Journal of the Society*: most of the positions are marked in the map which illustrates Sir G. Temple's route.

Results of Barometric Observations.

	English feet above the sea.
The Camp at Ed-dere'án	280
———— Neahmáyah	820
Summit of Jebel Fejúj	1021
Redoubt at Hammám el Berda'ah	980
Fortress at Kālemah	924
Camp at Mejáz 'Amár	863
Level of the river Sebús near Mejáz 'Amár	795
Jebel Ḥaṣanīyah (northern spur of Rás el 'Aḳabah)	1923
Pass of Rás el 'Aḳabah (by the new road)	2718
Bed of Wád-ez-Zenátī (at ford of Sídī Tamtám)	2086
Ḳobbeh of Sídī Tamtám	2208
Summit of hill near Rás-ez-Zenátī, on right bank of river	2842
Level of Wád el Bokrah at the point where the road crosses it	2700
Line of separation of waters flowing N.E. to the Zenátī and Sebús, and westerly to the Abú Merzúḳ and the Rum	2867
Summit of the Mountain Umm es-Setáḥ el Sharkīyah	3575
Kōstantīnah at the north point of the Kaṣbah	2300
Sídī Rashíd at south point of the city	1968
The monument at Es-gúm'ah	2666
Summit of Jebel Sídī Meshíd (1600 yards N.N.E. of centre of city)	2758
———— Setáḥ el Maṣṣúrah (1200 yards S.E. of centre of city)	2486
———— Jebel Emṣálī (1640 yards S.S.W.)	2344
Marábút of Sídī Mabruk (2300 yards E.S.E. of centre of city)	2340
Summit of Kudyaṭ 'A'tī (840 yards S.W.)	2338

English feet
above the sea.

The causeway opposite Báb el Wád, connecting the plateau of the city with Kudyaţ 'A'ú (440 yards S.W. of centre of city)	2230
El Kahtarah over Wád er-rummel (550 yards E. by N. of centre)	2082
Confluence of Wád er-rummel and the Abú Merzúk (one mile S. by E. of centre)	1867
Surface of Wád er-rummel under the great bridge (550 yards E. by N. of centre)	1741
above the cascades	1705
below the cascades and the mills	
(730 yards N.N.W.)	1548
at its junction with Wád el Melah	
(2200 yards W.N.W.)	1413

The mean of several observations gives the latitude of *Koştanţinah* at
 The Kaşbah, near the north end of the city 36° 21' 3" North.
 The Breach at the south-west angle of the city 36° 20' 41" „
 The fountain at Sidí Mabruk . . . 36° 20' 29" „

The longitude of the Kaşbah obtained by the total eclipse of the moon on the 13th of October, 1837 = 6° 0' 30" East of Greenwich.

[N.B. As this longitude differs from 25 to 30 miles from all former determinations of *Koştanţinah*, it is recommended that it should be received with caution; Shaw, who was there in 1726, assumed the longitude of *Koştanţinah* at about 6° 30' East; M. D'Avezac,* in 1836, was disposed to adopt 6° 24' East.

It may be worthy of remark that Shaw, with his limited means, fixed the latitude of *Koştanţinah* within one mile of the recent determination by M. de Falbe.]

Besides the above notes, and the account by Sir G. Temple given at p. 39 of this volume, Colonel Harding, of the Royal Engineers, has had the kindness to communicate to the Society the narrative of his Journey from Bónah to *Koştanţinah* in 1826, which contains much valuable information relative to the country at that time, and would certainly have been published in the *Geographical Journal* had not the later route by Sir G. Temple reached the Society at the same moment.

Colonel Harding's MS. is preserved in the library for reference, and may be consulted with advantage.

* In his excellent work *Etudes de Géographie Critique*, p. 58.

XIX.— *On the Bay of Antioch, and the Ruins of Seleucia Pieria.* By Lieutenant-Colonel CHESNEY, Royal Artillery, F.R.S. Read May 14, 1838.

THE Bay of Antioch is spacious, free from rocks, and well sheltered on every side, with the exception of the south-west, where, in the distant horizon, is seen the lofty island of Cyprus; the anchorage, however, is good, and the water deep, almost to the very beach.* This was the spot selected, in order to avoid the Beilán mountains, for the disembarkation of the party destined to proceed on the expedition to the Euphrates. On the 3rd of April, 1835, H.M.S. Columbine, followed by the George Canning, under all sail, led the way from the offing towards the anchorage. To the south, as we proceeded, was the lofty Jebel el 'Akrah, rising 5318 feet above the sea, with its abutments extending to Antioch. To the north, the Beilán range (5337 feet), well stocked with fine forest-trees, chiefly oak, walnut, and fir; and in front the broad expanse of the bay backed by the hills of Antioch, Mount St. Symeon, or Bín-kiliseh, covered with myrtle, bay, and arbutus, altogether forming a striking and magnificent Panorama. We all felt on many accounts a deep interest, as we approached the bottom of the bay. The pilot of the Columbine (a Greek), although selected as knowing this part of the coast, admitted just then, that he had never entered the bay before; and there was but one person in the expedition who had visited this part of the country, and that only by land. The vessels continued their course for a considerable time, finding no bottom with twenty-five fathoms of line; and as there was no appearance of the river Orontes, great uneasiness was felt lest we might have mistaken the intended bay; until, after some suspense, and a good deal of anxiety, the extensive line of excavations along the sides of the rocky hills behind the ruins of Seleucia were discovered to the left, but still at some distance. In less than an hour the Columbine began to shorten sail; being then in ten and a half fathoms water, and sufficiently near to the land, she hauled her wind and stood towards the south side of the bay, until the inner part of the Orontes was seen, from the topmast-head, winding towards its æstuary; which, owing to its slanting direction, was still hidden from view: both vessels then tacked, and stood towards the ruins of Seleucia, near which they anchored soon after sunset.

The southern horn of the bay of Antioch trends inwards east by north about seven miles to the beach. Near its outer extre-

* At one and a half cable's length from the beach there are three fathoms water, and it gradually deepens to seven and a half. Opposite the bar, at three quarters of a mile distant, and close to the land on the south-west side, are the best places for anchoring.

mity is the little bay or fissure called Kasab, and three miles nearer to the main-land, that of Kará Mayor; which is rather larger, and has a good anchorage off it close in to the shore;* the rest of the distance along the foot of Mount Cassius being precipitous, and for the most part inaccessible, as far as the beach, beyond which, the range of Jebel el 'Akrah runs towards Antioch in the previous direction east by north, with the rich picturesque valley of the Orontes at the foot, and the celebrated fountain of Daphne on its slope. The bight of the bay forms an almost imperceptible curve. At four miles north by west, half west, from the foot of Cassius, is the present æstuary of the Orontes; having what is called the Custom House about one mile from the bar in a strait line east by south, and the ancient port of Antioch about a mile further.

According to the reports of the natives, as well as the appearance of the marshy ground, the river entered the sea formerly by a second branch close to the mountain on the south side, which probably formed the small island we find marked on some older maps. Eight miles and a half north by west, half west, is the other horn of the bay, which is formed by Jebel Músa; on the base of which opening north-west are the ruins of the well-known city built by Seleucus Nicator to celebrate his victory over Antigonus; but it has a much deeper interest to the Christian, from being the spot where Paul and Barnabas embarked for Cyprus.

On the eastern side of Jebel Músa is the large and scattered village of Sweidiyah, situated in a rich picturesque valley filled with fruit gardens, chiefly mulberry,† and producing a variety of good fruits, as well as the finest silk in Syria. Southward from the village is the low mountain called Bín-kilîseh,‡ the sides of which are thickly covered with myrtles, interspersed with arbutus. On the crest of the hill are the ruins of the convent of St. Symeon Stylites. Here is part of a column of very large dimensions cut in the solid rock, and close by are the scattered fragments of the extensive convent dedicated to St. Symeon, which was destroyed in the sixth century, now almost covered with shrubs. Close at the foot of this low mountain, on the south-east side, the Orontes breaks through a deep valley, and makes a very winding course both above and below. The summit is about five miles from the sea, and commands a beautiful view westward, over a very rich plain extending to the sea, closed in by Mount Cassius to the southward, and the Jebel Músa range to the northward; whilst to the east is the valley of the Orontes, terminated by the castellated hills of Antioch; the general view being closed to the north-east

* An Egyptian sloop of war lay here at one time, and also several small merchantmen at intervals during our stay.

† The bay-tree and myrtle are particularly large; and the oranges, peaches, nectarines, and figs are particularly good.

‡ 1000 churches.

by the Beilán mountains. It was hoped that the stores might have been carried altogether by water to Antioch, but, as the river proved rapid, usually without even the assistance of a path along its bank, and there was besides little inclination to accommodate us with a temporary passage through the fish-weirs, this part of the plan was abandoned after tracking up the keelsons of both vessels only. The windings give a distance of about forty-one miles, whilst the journey by land is only sixteen miles and a half. Ibráhím Páshá talked of making the river navigable, which might be done by blasting some rocks in its bed, and by removing the wooden fish-weirs which traverse the river in several places near Antioch; it would also be necessary to cut a towing-path for horses through the woods along its banks. Lieutenant Cleaveland and the other officers were of opinion that a short tug-steamer of sufficient power would certainly go up the river to Antioch, which was, in fact, done by the Columbine's boat for the greater part of the way; and if a row of piles were to be driven into the sea, in the line of the river, extending beyond the bar, so as to enable the current of the river to carry the sand and mud farther out into deep water, the Orontes would then admit vessels of 200 tons, instead of being obstructed by a bar, over which there is a depth of water of from three and a half to nine feet, in winter. At any rate, it might be made navigable for boats, as the average fall of the river between Antioch and the sea scarcely exceeds five feet and a half per mile; and boats would then go twenty-seven miles above the town to Murád Páshá, and different parts of the lake of Antioch.

'Alí Páshá, the present governor of Bagdad (once governor of Aleppo), had, however, a different project, when he turned his thoughts to the means of increasing the commercial prosperity of this part of Turkey. The foundation of his plan was to be the restoration of the once magnificent port of Seleucia, the masonry of which is still in so good a state, that it merely requires trifling repairs in some places, and to be cleared out, which might have been done for about 31,000*l.*, and partially for 10,000*l.** On the south side of the entrance there is a very substantial jetty, formed of large blocks of stone secured by iron cramps. It runs north-west for seventy yards to the sea, and it may still be traced curving more to the north under water, and overlapping the northern jetty, which is in a more ruinous state, but appears to have taken the direction of W.S.W., forming a kind of basin with a narrow entrance tolerably well protected, and altogether suited for the Roman galleys. The ancient flood-gates are about fifty yards east of the south pier. The passage for the galleys, &c., is cut through the solid rock, on which are the remains of a defensive tower on each side; apartments below, with the remains of staircases to the

* According to the estimate of Mr. Vincent Germain.

top of each, are sufficiently distinct, as well as the places where the gates had been suspended between the towers.

Immediately on passing the gateway the passage widens to about 100 yards; it takes the direction of S.E. by E. between two solid walls of masonry for 350 yards, to the entrance of the great basin, which is now closed by a garden-wall. The port or basin is an irregular oval of about 450 yards long by 350 in width at the southern extremity, and rather more than 200 at the northern. The surrounding wall is formed of large cut stones solidly put together, and now rising only about seven feet above the mud, which during the lapse of ages has gradually accumulated so as to cover probably about eight feet above the original level. The exterior side of the basin is about one-third of a mile from the sea; the interior is close to the foot of the hill. The walls of the suburb touch the south-western extremity of the basin, and extend S. by E. from thence parallel to the sea for three quarters of a mile, when they turn eastward for the same distance, flanked at short intervals by square towers. These walls form a triangle, touching the basin at one end, and the walls of the principal city at the other, so as to inclose what is described by Polybius, and subsequently by Pococke, as the market-place and suburbs.* The walls of the interior part of the city appear to have had, as usual in Roman fortresses, a double line of defence, sweeping round to the north, where they rest against the hill, which seems to have had a castellated citadel on its summit. On the S.E. side of the walls is the Gate of Antioch, adorned with pilasters and defended by towers: this entrance must have been very handsome: near it, and parallel to the walls, are the remains of a double row of marble columns. The space within the walls of the town and suburbs, which have a circumference altogether of about four miles, is filled with the ruins of houses. A short distance from the town, on the east side, are the remains of a large amphitheatre tolerably distinct. About fourteen rows of seats may be traced in a semicircular form, filling up the whole of the valley in which the amphitheatre is placed, with its opening to the west commanding a fine view of the bay. To the S.E. and behind the hill (on which is the amphitheatre) are the remains of two temples; the fragments of pilasters, shafts, &c., are numerous; one seems to have been of the Corinthian order, in good taste, but I could not make out the plan of either of the buildings. The range of hills behind the ruins extends almost two miles, and contains, along its sides as well as in the valleys, numerous excavations, which are almost continuous throughout this distance. Generally speaking, they form only a single row and of small size, but occasionally

* Pococke, vol. ii. p. 184.

there is a second line of them, above or below the others, for part of the distance. These grottoes (evidently sepulchral) are generally of two kinds; the larger about twelve feet long by seven wide, having the front supported by pilasters left in excavating the solid rock, and within are three niches for bodies, viz., one on each side and one at the back of the same dimensions, viz., two feet and a half high and the same width, with a raised place left in the niche, of solid stone about four inches high, like a pillow for the head to rest upon: these niches are sometimes arched, but generally flat above. The smaller grottoes have a niche at each side with a narrow space between them. One set of grottoes is called the Tomb of the Kings; it consists of a façade-entrance and several apartments one within the other, with columns and a staircase leading to another range of rooms above. In addition to these, which are the most striking, there is another single grotto of large dimensions in one of the valleys along the side of the hill: this excavation is 100 paces by 60 wide and 25 high in the centre, the rock being excavated so as to form an arch springing from the ground on each side, that is, without side-walls. In addition to these sepulchral grottoes, of which some hundreds cover the face of the hills and all their valleys, there are many sarcophagi scattered about in every direction, always of good workmanship and tolerably perfect; although they have been opened in almost every instance probably in search of money.

But the most striking part of the interesting remains at Seleucia is a very extensive excavation cut through the solid rock from the north-eastern extremity of the town, almost to the sea;—part of which is a deep hollow way, and the remainder regular tunnels—executed with great skill and considerable labour.

In following the line from its eastern to its western extremity, a distance of 1088 yards, we have, in the first place, a hollow way of 600 feet long by 22 wide, through compact tertiary lime-stone, and of different heights at the sides, as it enters the hill. Next to this we have a regular tunnel, 293 feet by 22 wide, and 24 high. Then follows a second hollow way, 204 feet by 22, having on its south side an aqueduct cut in the rock 18 inches wide, which takes its departure from the bottom of the passage; and, by continuing onwards almost level, whilst the excavation itself descends by a more rapid slope, it reaches the surface eventually, and is carried southward to supply water to the town. In this portion of the cut which is 110 feet high, and narrowing towards the top, there is a narrow stone staircase from the surface to about 14 feet from the bottom; which probably was the usual water line. The opening above is well shaded by trees overhanging the aperture, which give it a very picturesque effect. The hollow way just mentioned is succeeded by a second tunnel 102 feet long by 25 feet 6 inches

wide, and nearly the same height. After this it again becomes a hollow way for 190 feet of the same width, but in some places attaining the height of 110 feet, or even more; and there is a very beautiful arched aqueduct passing from one side to the other at a height which now is lessened to 50 feet. From the excavation it continues a hollow way of 17 feet 6 inches wide and 41 high, for 750 feet; where are some tombs excavated in the rock at the top, and close on the N. side of the aperture; which continues 125 feet farther to an opening in the rock on the S. side of the excavation, through which the water seems to have forced itself over a rocky, broken, and steep descent directly into the great basin. Hitherto the cut has had the general direction of W. $\frac{1}{2}$ S., but it now sweeps gradually round to the northward, and after a course of 325 feet, it is crossed by an arch bearing some inscriptions scarcely to be made out. The remainder of the hollow is 427 feet long, 30 feet high, and 17 feet wide, still sweeping N. until it terminates abruptly at about 30 feet above the level of the sea: the bottom of the rest of the excavation is tolerably regular, but in this portion it is impeded by large masses of rock lying across it at intervals.

The termination is, as has been remarked already, abrupt and very imperfect; nor are there any marks of the steps mentioned by Polybius, or any other regular communication either from the excavation to the basin or even to its entrance at the piers; but as the rocks are broken away in the latter direction, and as the action of the water has carried away every thing like art in the former, it is by no means impossible that there may have been at one time a flight of steps from the flood-gate to the hollow way; and also a regular channel available at pleasure, descending from the broken aperture, so as to give a rush of water to clear out the port. The Romans were not accustomed to leave such works as this must have been in an imperfect state; such a fine basin as the inner port of Seleucia would naturally receive every kind of attention they could bestow upon what was most likely the winter harbour of their galleys; for the piers were so constructed as to form an outer harbour during the summer season. Opinions are divided about the object of this great work. Some have thought it was for defence, others that it was a mere road to avoid the hill when passing from the sea to the east side of the town, while some fancy it was intended expressly to clean out the mouth of the port. As a defensive object it must have been comparatively useless, since the cut or ditch may be passed along the hill above the two tunnels, and also by means of the bridges; added to which, there is not any flanking defence whatever, which seems to be necessary even if it were but a road, in which case an easier line could have been selected along the foot of the hill directly through the city. Pococke says it was a water-course, and gives as a proof—the native

name "Garez," which I find in the Turkish dictionary explained "a subterraneous channel to convey water." Pococke adds, "the water formerly ran through it, but now it does not go that way unless after great floods. It is said that the Arabs, coming into these parts, turned the water to the north-west, where I saw it run by a sort of subterraneous passage. The stream also in some parts takes its old course, though stone walls were built, which are still standing, to turn it another way." There was a stream running through it when I visited these ruins in 1832, and the water then ran along the excavation as far as the broken place, through which it made its way towards the old basin precisely as it did in the time of Pococke: I am therefore inclined to believe, with him, that it must have been really a water-course in any case, but whether to clear the entrance of the port, or simply to collect the several springs and rivulets rising in the hills above the city, (so as to command a supply,) is not so easily determined. There are, however, remains of other water-courses cut in the hills in the direction of the houses. This city was besieged, stormed, and taken by Antiochus the Great. The environs of Seleucia would have been still more celebrated in modern times had it not been for the campaign in Russia. In 1811 Napoleon had prepared a fleet at Toulon which was to have disembarked a large force in this bay, and Mr. Vincent Germain was waiting at Antioch for the expected troops, which had in the mean time been marched to Russia instead of taking the route from Suweidiyah to India. Mar'ash was to have been the centre of the operations, probably on account of the fine forests near that town; but as the Beilán Mountains would have furnished plenty of fine timber close at hand, it is not likely that this great Captain would have gone to Mar'ash when 110 miles through Antioch and Aleppo would have placed him at Beles, 200 miles lower down the river; for, although the details of the proposed operations are not known, there is every reason to presume that Napoleon meant to carry his troops down the river Euphrates to Basrah, which was to have been made his first *place d'armes*; and when it is recollected that the fine harbour of Grane (Korein) is within one day's march, he would, in all likelihood, have pushed on thither immediately, with a view to the gradual acquisition of Abú Shehr, Bahreïn, Maskat, Kishm, and the other numerous ports on both sides of the Persian Gulf, by gradual movements along the coasts from one place to the other; the Russian campaign however put an end to this, and indeed all his other projects; and the line of the river Euphrates still belongs to our old ally Sultán Mahmúd.

XX.—*A Sketch of the Progress of Geography;—and of the Labours of the Royal Geographical Society, during the year 1837-8.* By Captain WASHINGTON, Royal Navy, Secretary.

EACH year as it passes away contributes its share to the general stock of geographical knowledge, and is marked by the gradual progress of maritime and inland discovery; nor will the past twelve months yield to any since the establishment of this Society, either in the advancement of discovery, or in the importance and extent of the subjects of geographical inquiry brought before us.

For the moment our attention is arrested by the recent intelligence of Arctic discovery, and cheerfully do we award to Messrs. DEASE and SIMPSON their full measure of credit for the triumph they have achieved on the northern coast of America. Discovery has in itself a charm that irresistibly attracts attention from all minor subjects of geographical research, and leads us away from the slowly acquired, yet important, details that are absolutely requisite towards obtaining an accurate knowledge of the surface of the globe which we inhabit.

Such details must, however, necessarily form the chief subject of the following pages; for, although it would be a far easier and far more grateful task, to touch only on the progress of discovery in the various quarters of the world, this would afford a very imperfect report of the works of many laborious men, and would entirely omit the account of the advancement of topographical knowledge during the year.

EUROPE.

In Europe, more especially, such a sketch would be nearly useless, as in this portion of the globe nothing but the most minute details can satisfy the demand of the present advanced state of science:—itineraries and route surveys are obsolete, we may hope, in nearly every kingdom in Europe, and in many of these an accurate geodetic survey is now in progress.

To commence, then, with our own country:—

BRITISH ISLES.—In England, four whole sheets (or sixteen sheets as now issued) of the “Ordnance Map,” extending over about 3000 square miles, and comprising parts of the counties of Norfolk, Suffolk, and Denbigh, have been finished during the past year, thus completing seventy-five sheets of the 120 of which the whole map will be composed; the portion published includes all the southern and midland counties, and the greater part of Wales. The surveys for this map are made on the scale of two inches to a statute mile, and are engraved one-fourth of this size, on the scale of one inch to a statute mile, or $\frac{1}{4}$ of nature; each whole

sheet contains 800 square miles of country, and about four times this space is annually surveyed, and engraved in the course of the following year.

Few persons, on looking at this map, reflect on the great labour that must necessarily be bestowed upon it, to bring it to the degree of accuracy of detail and beauty of execution manifest in some of the later sheets; we may direct attention to that containing the mountain of Cader Idris in Merionethshire, as a specimen of drawing and engraving not commonly surpassed: the whole survey is conducted under the superintendence of Colonel Colby, R.E.; the construction and engraving are under the direction of Captain Robe, R.E.; and Lieutenant Bailey, R.E., conducts the field surveys.

A portion of the mountain of Snowdon, engraved in the relief style by Mr. Freebairn from a model and beautiful drawing executed by Mr. G. Carrington, ordnance surveyor, represents admirably the relief of the ground. About four square miles of the Undercliff in the Isle of Wight also have been recently modelled on the scale of three feet to a mile; and might be accurately represented on paper with very little trouble by the above mode of engraving.

Nine sheets of the geological map of England, by Mr. Dela-beche, assisted by Mr. M'Lauchlan, ordnance surveyor, including the counties of Cornwall, Devon, and part of Somerset, on the same scale, are also completed.

In Scotland orders have at length been given to commence the new government survey; preparations are making for continuing, in the course of the present summer, the series of primary triangles carried over a great portion of that country in former years by General Mudge and Major Colby.

In the mean time, some few points near Arran, on the west coast, have been determined by Mr. Galbraith of Edinburgh during the past year.*

In Ireland, the "Townland Survey," on the scale of 6 inches to a statute mile (thirty-six times the size of that of England), or $\frac{1}{10800}$ of the natural scale, proceeds rapidly; the counties of Meath, Leitrim, Longford, and Sligo, contained in 160 sheets, have been completed during the past year, making fourteen counties and 530 sheets published.

A map of the whole of Ireland, in four sheets, on the scale of $12\frac{1}{2}$ inches to a degree, based on the Government Survey, carefully executed and well engraved by Messrs. Walker, is just published at Dublin.

In connexion with the Townland Survey, an admirable Me-

* Ed. Phil. Journal, April, 1838.

moir of the County of Londonderry (the first of the series) is just published, giving an account of the natural, artificial, and general state of the county; a work which may be taken as a model for all descriptions of counties, and does honour to Lieutenant Larcom, R.E., and to the officers who have superintended its execution.

A curious statistical map of Ireland has also been engraved by Mr. Gardner, from a design by Lieutenant Harness, R.E., showing, by a great variety of shade, but without colour, the density of population in the different parts of the island.

The labours of the hydrographic department, under the direction of Captain Beaufort, R.N., have kept pace with the land survey of the British Isles.

The surveys of the rivers Thames and Medway having met at the Nore Light, Captain Bullock has been employed on the sands between that anchorage and Margate: he has found that many changes of great importance have taken place in their shape, extent, and position, of which neither the Trinity House nor pilots had any knowledge. We understand that the Hydrographic Office intends publishing a comparative view of the present state of these banks with that shown by some charts of the last century.

The nautical survey of the east coast of England is nearly completed, and most of it has been published. The Scottish shore has also been examined by Captain Slater and his assistants as far as the gulf of Cromarty, and in no very long period the whole eastern board of the island from Dover to John O'Groats house will be engraved. The Orkneys are likewise in the skilful and industrious hands of Mr. Thomas, R.N., and will, when finished, present the same singular and interesting features as the beautiful chart of the Shetlands, which issued from the Hydrographic Office in the course of the past year.

The survey of the North Sea, under Captain Hewett, R.N., is one of the most important naval surveys that has been undertaken by the Admiralty; and the most interesting sheet of it, the result of about 100,000 soundings, will be speedily published. Many of the old banks have been found to be erroneously placed, and wrongly sounded; while numbers of new banks, absolutely unknown before, have been discovered, and others have been doubled in length; one for instance, the *Falls*, is ten miles longer than it was supposed, and has in some places not more than four fathoms on it at low water, while its ridge-like form—the character of all the North Sea banks—is so narrow, that a vessel might well have a deep-water cast before and after crossing it, and remain ignorant of its existence.

The examination of the coast of North Wales, by Lieutenant

Sherringham, R.N., is completed, and has shown how much use may be made of Caernarvon Bay as a port of refuge, if the Trinity House could be induced to light the south-west entrance to the Strait of Menai. The survey is now continuing between Milford Haven and Cardigan Bay in South Wales, which will include that dangerous group of detached rocks which project from St. David's Head, and on which so many vessels have been wrecked.*

The survey of the large æstuary of the Solway Firth, three fourths filled with shallow sands, and yet possessing channels of great value and safety, is nearly concluded; it has already produced a complete revolution in the manner of navigating it, and in the disposition of the buoys and beacons. The inhabitants of its shores are anxious to improve the approaches by lighthouses judiciously placed; and the residents on the shores of the Clyde are eagerly looking to the northern progress of this surveying party, under Lieutenant Robinson, R.N., in order to develop and augment their commercial facilities.

The steam-vessel commanded by Captain Beechey, R.N., was appointed to the survey of the Irish Channel too late last year to have produced any great result; but when finished the survey will be invaluable to the extensive commerce which frequents this channel, by enabling the mariner, who is not too lazy to keep his lead going, to find his way without sight of land, sun, or stars.

The coast from Dublin round by the north to Sligo Bay is now finished, and most of that part of the survey has been already published.

The great internal and deep-water lakes of Neagh and Erne are finished, and the surveyors, Lieutenant Wolfe and his assistant, are now employed on the navigable lakes Ree and Derg, traversed by the Shannon.

Exact registers of the tides kept at the Ports of London, Liverpool, and Bristol, as well as at all the Royal Dockyards, will help to furnish more accurate *data* wherewith to elucidate the theory of tides. The valuable researches of Messrs. Whewell and Lubbock on this subject, published in the *Philosophical Transactions*, entitle them to the gratitude of all physical geographers; but voyagers and travellers, in whatever part of the maritime world they may chance to be, can materially assist these eminent men in their researches by accurately registering the **TIMES OF HIGH WATER** daily, for a whole lunation, and the heights if convenient: the former is the principal object.

FRANCE.—The great topographical map of France, in 258 sheets, on the scale of $\frac{1}{800000}$ or $\frac{1}{10}$ of an inch to a geographical

* The writer is indebted to the Hydrographer to the Admiralty for much of the above information.

mile, publishing at the Dépôt de la Guerre, under the direction of General Pelet, has added 12 sheets during the past year, chiefly of the north-eastern provinces, making 54 sheets already published since the year 1833. The second part of the new geometrical description of France, by Colonels Puissant and Corabœuf, containing the results of the geodetic operations on which the survey is based, is completed, and will form part of the eighth volume of the "*Mémorial du Dépôt de la Guerre*." The Dépôt is also occupied with a map of the department of the Seine, in 9 sheets, on a scale of $\frac{1}{400000}$, or $1\frac{8}{10}$ inches to a geographical mile; and with a topographical map of Guyenne, in 54 sheets, which is nearly finished.

The *Pilote Français*, published under the direction of Admiral Hamelin, Chef du Dépôt de la Marine, ably seconded by MM. Beautemps-Beaupré and Daussy, containing the survey of all the coasts of France, advances rapidly to its termination. This noble work, of which that nation may justly boast, begun in 1816, will probably be completed during the present year.* The Dépôt de la Marine, besides other works which will be mentioned in their place, have also published the *Voyage of the Thétis and Espérance*, executed in 1825 and 1826, under the orders of M. de Bougainville, a copy of which, with their accustomed liberality, they have presented to the Library of the Geographical Society.

Other valuable publications, by men well known for their geographical works, are in progress in Paris, but there is one far too important to seamen not to claim distinct notice, namely, a table of "*Positions Géographiques*," by M. Daussy, published annually in the Appendix to the *Connaissance des Temps*; this is revised every year, all recent determinations are added to it, and where any discrepancy appears the subject is discussed: that the results arrived at may not be always infallible, and that the decisions may be occasionally arbitrary,† does not prevent the work being very useful, and we sincerely hope M. Daussy may have leisure to continue carefully his "*additions*," convinced that a more acceptable service to geography cannot be made.

SWEDEN AND NORWAY.—Besides Colonel Forsell's map of Scandinavia in eight sheets, we learn that he has constructed a continuation of it in six sheets for the northern part of the country, but is not sufficiently satisfied with its accuracy to have it engraved.‡ In Norway they are now occupied in surveying the coast from Trondheim to the North Cape; but some time must elapse before we can look for a detailed map of this country.

* Notice des Travaux de la Société de Géographie en 1837, par M. Noel Desvergers, p. 274.

† See p. 240.

‡ Col. Forsell's Letter.

Geography will probably benefit by the visit to Lapland of M. Gaimard and his companions during the present summer.

The Society is indebted to the Foreign Office for an account of five Norwegians of Hammerfest, left during the winter of 1836 on one of the "Thousand Isles" near the south-eastern extremity of Spitzbergen, affording another proof of the endurance of man under circumstances of no common privation.*

ICELAND.—M. Marmier's *Lettres* give the account of the late expedition to this island, and the ninth *livraison* of the *Voyage en Islande*, by MM. Gaimard and Robert has just been published, at Paris, by the Dépôt de la Marine, and liberally presented to the Library of the Geographical Society.

BELGIUM.—The spirited director of the geographical establishment at Bruxelles has lately published a geometrical plan of the city by M. Craan, in four sheets, on the scale of $\frac{1}{2500}$; two sheets of the map of the environs of Brussels, in nine sheets; and the first sheet of a cadastral map of Belgium, besides some statistical works.

PRUSSIA.—Engelhardt's map of Prussia, in twenty-four sheets, seems to be the best published; besides this there are various special maps of portions of this kingdom on a large scale. Berlin may be considered the head-quarters of geography in Germany; its Geographical Society has just held its fifth anniversary: Ritter here writes his admirable *Erd-kunde*; Berghaus publishes his *Annalen*; his *Atlas von Asien*; and in the present year he has added a *Physikalische Atlas* to his former labours.

SAXONY.—The great topographical map of this kingdom is publishing at Dresden under the direction of Colonel Oberreit, in twenty sheets, on the scale of $\frac{1}{87500}$, or 1·25 inch to a geographical mile; it is founded on a survey executed by the engineers between 1781-1805, and gives the height of all places above the sea. Five sheets are already published; the representation of the mountains is according to scale, and the whole is admirably engraved—the general effect perhaps is rather too dark.

The Statistical Society of Saxony, under Dr. Schlieben, steadily continues its labours.

HESSE DARMSTADT.—Twenty-five sheets of a map of this territory, to be contained in fifty sheets, on the scale of $\frac{1}{30000}$, from an accurate survey by M. Von Eckhardt, of Darmstadt, are now published. The mountains are represented according to the plan of Major Lehman.

FRANKFORT.—A map of the territory of Frankfort and its immediate neighbourhood, on the scale of $\frac{1}{75000}$, and based on trigonometrical points, has just been published by M. Ravenstein; who has also completed a portion of a beautiful model of the environs

* MS. in Library.

of the city and of the Taunas mountains, which accurately represents the relief of that picturesque country; it is on the horizontal scale of $\frac{1}{20000}$, and that of $\frac{1}{5000}$ for the elevation.

It is proposed to make a model of the Rheinlande from Mainz to Bonn, including the vallies of the Main and Lahn: to judge of it by the specimen, kindly presented by M. Ravenstein to the Geographical Society, it will be a very valuable work.

Several communications of much interest have been read before the Geographical Society at Frankfort during the past year, of which we may notice that on the Bolivian province Chiquitos, by the president, Dr. Kriegk; on the great coal fields of England, by M. Meidinger; and an ethnographical sketch of Old Palestine, by M. Seligmann.*

BADEN AND WURTEMBERG.—Twenty-four sheets of the great topographical map of Wurtemberg, in thirty-eight sheets, are published; a map also of this kingdom, and of the duchy of Baden, in twelve sheets, on the scale of $\frac{1}{200000}$, or about three miles to an inch, has been finished during the past year by M. Woerl at Freiburg, and liberally presented to the Geographical Society. The map is remarkable in having the rivers, roads, and boundaries stamped upon it in colour. A model, in relief, also, of these countries, has been executed by M. C. Rath, at Heilbronn.

SWITZERLAND.—The map of this country by Colonel Dufour, we learn from M. Chaix, is in progress; as also an orography, or description and height of mountains, within a circuit of twenty-five leagues around Geneva. MM. Woerl and Heck have also published a map of Switzerland in twenty sheets, on the scale of $\frac{1}{200000}$; and we learn that M. von Michaelis is just appointed to survey the canton of Aargau.

BAVARIA.—Eighty sheets of the government topographical map of this country, to be completed in 103 sheets, have been published.

AUSTRIA.—The maps of the great government survey of this country, under the direction of Colonel Skribanek, of the Bureau Topographique, engraved on the scale of $\frac{1}{144000}$, will consist of Austria (Ober and Nieder) in forty-seven sheets; the Tyrol and Vorarlberg, in twenty-four sheets; Salzburg, &c. in fifteen sheets; Styria and Illyria, in thirty-seven sheets; the first sheets appeared in 1811, and about one-third of the whole are now published: the survey of Moravia is finished, but of Bohemia, Croatia, and Galicia no survey exists.†

HUNGARY.—The first seven sheets of a map of Hungary, in nine sheets, by Professor Schedius, at Pesth, are lately published; a government survey is also commenced. The rapidly-

* M. Ravenstein's Letter.

† Baron C. Hügel's Letter.

increasing communication down the Danube will doubtless shortly lead to a better acquaintance with this fine country, as also with the adjoining states of Servia, Bosnia, and Montenegro,* which the pen of Vuk Stephanowich has shown to be well worth cultivating.

ITALY.—Thirty-six sheets of the great Austrian map of the Lombard-Venetian kingdom, in 43 sheets, are published. This map, drawn on the scale of $\frac{1}{100,000}$, and engraved on the scale of $\frac{1}{100,000}$, or $\cdot 83$ of an inch to a geographical mile, is constructed on a grand triangulation, carried on from a base measured near Somma, on the banks of the Ticino;—it is engraved in a good bold style, and the glaciers are very well represented—the heights of the mountains are not generally marked.

SARDINIA.—Three volumes of Casali's Dictionary of this monarchy are finished, comprising the article *Casale*; and Zuccagni Orlandini's Corografia is not yet carried beyond the kingdom of Sardinia.

PARMA, PIACENZA.—Molossi's Geographical Dictionary of these Duchies is nearly completed; an analysis of this work has been kindly presented to the Library of the Society by our active correspondent Count Gräberg af Hemsö, at Florence.

At Bologna a Geographical Journal is about to be published by Count Ranuzzi, aided, it is said, by Chevalier Balbi: we trust that the authors will not content themselves with reproducing articles from other Geographical Journals, but give us an original account of much that Italy possesses of interest to the geographer, viz. the old maps of the Pizzicagni, at Modena; of Fra Mauro, at Venice; of the Portulani, of Benincasa, &c. &c.

TUSCANY.—Repetti's Geographical Dictionary of the Grand Duchy has reached the word *Livorno*. The last fasciculus contains an excellent article on the *Littorale Toscano*. This tract of land, about 203 miles in length, from the river Magra to the torrent of the Chiarone, the limit of the Roman territory, is divided into six basins, the three southernmost are usually called the Maremma; the detailed description of them embraces many points of interest in comparative geography.†

The 5th part of Count Serristori's *Statistica d'Italia* gives a full account of the statistics of Tuscany; the 6th fasciculus reveals, for the first time, we believe, the statistics of the Pontifical states.

NAPLES.—The survey of this kingdom, the execution of which is under the direction of Colonel Visconti, has been connected by a careful triangulation with Northern Italy. The drawings are made on the scale of $\frac{1}{200,000}$, and will be published on the scale of $\frac{1}{200,000}$.

* Montenegro und die Montenegri. Stuttgart, 1837.

† Letter of Count Gräberg af Hemsö.

or $\frac{1}{4}$ of an inch to a geographical mile. The survey of the northern frontier was completed in 1836, and also part of the eastern coast, from Ascoli to Otranto. In the mean time a military map of the kingdom, on a smaller scale, viz. $\frac{1}{250000}$, was begun this spring, and will be advanced as fast as is consistent with such a work.

The 'Annali Civili delle Due Sicilie,' liberally presented by Colonel Visconti to the Library of the Society, contain much geographical information, with the measurements of many heights of mountains, &c.; as also does the 'Viaggio alla Meta,' &c., by Signor Capocci, Director of the Observatory at Cape di Monte, to whom and to Colonel Visconti we are indebted for much of the above information.

GREECE.—The map of Northern Greece, made by the French officers prior to the year 1836, is preparing for publication, in four sheets, at the Dépôt de la Guerre; a few officers are still employed surveying the country.* A paper on the Minoa of Megara, by Mr. Spratt, R.N., clears up a point of much interest in classical geography, and is highly creditable to this young officer employed on the survey of the shores of the Mediterranean.

TURKEY.—Weiss's general map of this empire, in twenty-one sheets, published in 1829, is the best that exists; portions of the country which have been the seat of war have been more accurately examined; and especially the valuable series of eighty-nine astronomical points in Wallachia, Bulgaria, and Roumelia, lately determined by officers in the Russian service, Captains Wrongschenko, Ortenberg, and Von Essen, and made public in June, 1837; † still no complete survey exists, and an intelligent traveller may here find sufficient occupation, and even discoveries to make, as has lately been shown by M. Ami Boué in his account of this country.

RUSSIA.—Thirty sheets of the great topographical map of this vast empire, to be completed in fifty-nine sheets, on the scale of $\frac{1}{420000}$, or about six miles to an inch, are now published. Much information relating to the Ural range is afforded us in the work of M. Rose; and we learn that M. Fedorow, the astronomer, lately returned to St. Petersburg, has measured trigonometrically several of the peaks in the more northern part of this range, and found them to rise between 8000 and 9000 feet above the sea. M. Helmersen has also given a description of the Ural Mountains, and M. Hamel a note on the level of Moskow, the river Moskwa and the Oka, above the sea.‡

CAUCASIA.—At the southern extreme of the vast Russian empire, on the limits of Europe and Asia, the long contested

* Notice Annuelle, par M. Noel Desvergers, p. 277.

† Bulletin de l'Académie de St. Petersburg, vol. ii. p. 210.

‡ Bulletin de l'Académie de St. Petersburg, vol. ii. p. 300.

question in physical geography of the depression of the Caspian Sea has been finally set at rest by the trigonometric levelling, from Novo Tcherkask, near the mouth of the River Don, by Stavropol to Kisliar on the Caspian; whence it results that the level of the latter is 101 feet lower than that of the Black Sea—a remarkable coincidence with the result obtained barometrically by Meyer and Lenz in 1835.* The decision of this question is highly creditable to Messrs. Parrot and Struve, who proposed the expedition, and to Messrs. G. Fuss, Sabler, and Sawitch, who have carried it into effect at the expense of the Russian government. Much light must also be thrown on the topography of the country, 400 miles in extent, through which the levelling was carried, and of its immediate vicinity; the details, however, are not yet made public.

M. Koppen has just published a much improved map, in four sheets, of the southern part of the Crimea. M. Eichwald, also, has inserted all the latest researches in his map of the Caucasian provinces, which illustrates the second part of his journey to the Caspian recently published; and lastly, we have the account by M. Dubois de Montpéroux, of Neufchatel, of his journey through the Crimea and the Caucasus, which he seems to have carefully examined both as a geologist and historian, as well as a geographer.

ASIA.

The vast continent of Asia still offers to travellers a fertile field for geographical research, and throughout the greater portion of it we can only look for a few astronomical points, well fixed and careful itineraries, to enable us to correct our maps. Of the actual state of our knowledge of this country, the admirable work of Professor Ritter, of Berlin, *Erdkunde von Asien*, offers an able summary; and next to this, Berghaus' *Atlas von Asien*, which has now reached its fifth part, claims notice as the best work on Asia in general.

SIBERIA.—Commencing at the north, we have just received the second volume of M. Erman's journey, describing his route from Tobolsk, by Irkutsk, Kiakhta, and Yakutsk, to Okotsk; the description of the Lake Baikal, of the valley of the Lena, of the Aldan Mountains, and his remarks on the origin and manners of the inhabitants of the little known countries of Northern Asia will be read with great interest.

Farther to the south, we have, at length, the account of the journey of MM. Humboldt, Ehrenberg, and Rose, in 1829, who travelled along the eastern foot of the Ural range as far as Bogoslovsk in 60° N.; thence they returned to Tobolsk, crossed the

* Bull. de l'Acad. de St. Petersburg, vol. i. p. 2.

great steppe of Barabinska to Bernaul, and the Altai Mountains, whose highest peak, *Bieluka*, we learn from M. Gebler, reaches 11,000 feet above the sea. Proceeding thence to Baty, a Chinese military post on the banks of the Irtysh, they returned across the steppe of Ishim to the southern range of the Ural, and thence to Astrakan on the Caspian Sea.

Accompanying the narrative is an improved map of part of Northern Asia, between the limits of 51° and 60° N. lat., and 47° and 69° E. long., on the scale of $\frac{1}{300000}$, or two inches and a quarter to a degree, which forms a valuable addition to the topography of that region.

M. Baer has communicated to the Society a notice on the frozen soil at Yakutsk, whence it appears that the frost there penetrates to the depth of 380 feet: M. Erman has corroborated this circumstance, and states that the mean temperature at Yakutsk being -6° of Réaumur, even a greater depth of frozen ground might have been expected.

KAMCHATKA.—A map of this remarkable peninsula, showing the position and giving the heights of its series of volcanoes or *sopki*, has just been completed by M. Erman. Admiral Lütke also, in his excellent *Voyage autour du Monde*, has given an account of thirteen, and the heights of many, of these volcanoes: he has also determined the chief points of the eastern coast of Kamchatka, and of the country of the Koriaks and the Chukchis, to the north-eastern extremity of Asia.

NOVAIA ZEMLIA.—A very excellent report upon all former voyages to these inhospitable shores has been presented by M. Baer to the Academy of Sciences at St. Petersburg,* from which we learn that the islands may be divided in half, longitudinally, and the whole of the eastern portion must be erased from our maps. M. Baer has himself visited the islands during the past summer, but the ice prevented any further examination of the northern shores.

TIBET.—The journey of *Shi fa hian*, a Buddhist priest and pilgrim, although made at the close of the fourth century, is too remarkable not to be noticed here. The work is entitled *Foe Koue Ki*, a Chinese MS., which has been translated by the eminent orientalist Rémusat, Klaproth, and Landresse, and gives the account of the pilgrim's visit to the chief seats of his religion during a space of fifteen years. From China *Shi fa hian* travelled to the north-west and west, across the great desert of Shamo to the lake Lob; thence to Khoten, and by the Hindú Kúsh, probably to Pesháwar, across the affluents of the Indus, by Benáres to Tamlúk, where he embarked for Ceylon and Java, and thence

* Bull. de l'Acad. de St. Petersburg, vol. ii., p. 138.

returned to his own country. This work shows that the names of places throughout India were Sanskrit; that the Pálí language, its immediate derivative, was studied from Ceylon to Khoten; that the Buddhist religion was then flourishing in the great desert and upper course of the Indus; and that in the fourth century the Hindús made voyages in vessels, containing 200 persons, from Bengal to Ceylon, Java, and China.

Much information is contained in the notes of the learned commentators of this work; and Professor Wilson, from his knowledge of Sanskrit, has thrown still more light on the subject in his analysis of the work, read before the Asiatic Society of London.

HINDU'STA'N.—The travels of Moorcroft and Trebeck in the Himálayan provinces of Hindústán and the Panjáb, in Ládákh, Kashmír, Kábul, and Bokhárá, very ably edited by Professor Wilson, contain a great addition to our knowledge of this region: the work is accompanied by a map by Mr. John Arrowsmith, very carefully compiled from the best sources. The narrative of the journey of Victor Jacquemont in India, publishing at Paris, has reached the 17th Number. The Society is indebted to Captain Pemberton for a detailed account of the district of Manípúr, on the north-east frontier of India, accompanied by a series of maps; the itinerary of two Burmese embassies from Ava to Peking in 1823 and 1833, by Major Burney;* and in the west of India Captain Wade's account of the river Setlej from Ludhiyárah to Mithan'kót,† have been published in the admirably conducted Journal of the Asiatic Society of Bengal. Thirty-six sheets of the great trigonometrical map of India, to be completed in 150, on the scale of four miles to an inch, are already published, and the survey, under the direction of Colonel Everest, E.I.C. Artillery, is now extending through the country north of the river Khrishnah.

BOMBAY.—The Geographical Society at Bombay proceeds steadily in its useful task of collecting and printing papers relative to India: many reports of high interest are contained in the two published volumes of its proceedings: it has also contributed to our Journal during the past year an account of the bore in the Gulf of Cambay, by Lieutenant Ethersey. This officer, as well as many others of the Indian navy, are employed on the nautical survey of the coasts and rivers of the western portion of India. The mission under Captain Burnes will doubtless furnish every information necessary to complete the geography of the main stream of the Indus from Attock to the sea, as well as of the adjacent provinces.‡ The survey of the mouths of the Indus by Lieutenant Carless, I.N., begun in 1836, has been continued

* Journal of the Asiatic Society of Bengal, Nos. 66 and 67.

† Ibid., No. 63, p. 169.

‡ Report of Bombay Geographical Society, 1837.

during the past year: the Kedíwári branch has been surveyed from its mouth to its outlet; the Hajámri branch was completed the year before, and we have now a trigonometrical survey of all the *open* mouths and branches, with a portion of the main rivers and the most dangerous part of the coast.

The surveys of the coast of Kat'hiwár and Gulf of Cambay have been completed by Lieutenants Whitelock and Ethersey; the examination of the latter has extended as far south as Surat, including the mouths of the rivers Sábarmatí, M'hái, Dhandar, and Narbadá, which he has examined as far as the city of B'haróch.

To explore the regions west of the Indus an enterprising officer started from Bhúj Kach'h in January, 1837. He crossed the Thar in an almost direct line to Kháirpúr, and arrived safely at Shikarpúr in his progress towards Belúchistán. The Thar, it is said, was found by this officer to present a less desolate aspect than is generally believed. Water was abundant on the line of his route, and the country was observed to be traversed by ranges of low hills, composed of sandstone, and thickly wooded.*

The chain of the Maldives has been completely surveyed by Captain Moresby, who is now engaged on a similar survey of the Chagos Archipelago. This officer will afterwards proceed to the examination of the bank *Saya de Malha*, situated about 300 miles south-east of the Seychelles; and probably also will survey the great and little *Basses* lying off the south-east point of Ceylon.† While on the subject of Ceylon, we must not omit to notice the history of this island by Joaõ Ribeiro, which has been published in the memoirs of the Academy of Sciences at Lisbon by their indefatigable secretary the Counsellor Macedo, from a rare and complete MS. It forms the fifth volume of the collection of *Memorias, &c., das nações ultramarinhas*, liberally presented to the Society by M. Macedo.

ARABIA.—The details of Lieutenant Wellsted's journey into the interior of 'Omán have been published during the past year; and the narrative proves even more attractive than was anticipated from the abstract of geographical information so promptly furnished to our Journal, and thereby doubling its value. We trust that some of the officers of the Indian navy now engaged in the survey of the southern coast of Arabia will profit by Mr. Wellsted's example, and endeavour to penetrate into the inland provinces of Hadramaut, Mahrah, &c. Of the survey of the Gulf of Akabah, at the head of the Red Sea, we have an excellent memoir by Lieut. Carless, I.N.; also a full description of Kishm and the islands at the entrance of the Persian Gulf, by Lieut. Whitelock, I.N.

* Report of Bombay Geographical Society, 1837.

† Ibid.

PERSIA.—The comparative geography of Susiana or Khuzistán, a subject which has been discussed by D'Anville, Rennell, Vincent, Von Hammer, and partially by Kinneir, seems to be on the point of being cleared up, partly by the labours of the Euphrates Expedition, during which the rivers Karún, Bahamishír, and Kornah, were partially examined and much new topographical information obtained; but more especially by the researches of Major Rawlinson, who, we understand, has devoted some years to the elucidation of this difficult subject—difficult, chiefly for want of correct topographical information. It would seem that the canal and river at Shúster have hitherto been confounded; that the name Abzál is erroneously applied to the Desfúl river; that the river Shapúr is omitted in our maps, besides many other points in the positive geography of Khuzistán that we trust ere long to see set right.

The Society is indebted to the kindness of Her Majesty's Secretary of State for Foreign Affairs for the communication of Major D'Arcy Todd's two separate routes through the provinces of Tálísh, Gilán, and Mázanderán; and to Mr. Taylor Thomson for an account of the first ascent of the Peak of Demávend by an European, when its height was ascertained barometrically to be 15,000 feet above the sea, and 11,000 above the level of the plain of Tehrán.

KURDISTÁN.—In this country, so difficult of access, we have Colonel Shiel's journey from Tabríz to Ván, round the southern shores of the lake to Bítlís, to Se'rt, then along the western bank of the Tigris to Jezireh, Erbil, and Suleimániyeh, during which much useful geographical and other information was obtained. Mr. Ainsworth, too, on his homeward route from Bagdad by Mosúl, in the course of the last year, visited Nimrúd (the Larissa of Xenophon), Nineveh, Nisibin in Sinjár, Márdin, and by Diyar Bekr reached Constantinople. In this journey he observed barometrically the elevation of the various mountain ranges, and noted the dip and succession of their strata. From the expedition under Mr. Ainsworth, shortly about to proceed to Kurdistán, we hope to reap a rich harvest in comparative and physical geography.

ASIA MINOR.—In this classic land of travels we, at length, begin to collect accurate geographic information; and Mr. W. I. Hamilton in his late journeys throughout the country, from Kars and the ruins of Anni on the east, to Smyrna on the west, has set an example, which we trust will be followed by all future travellers. By his various routes he has connected many important places with the north coast; has obtained observations for latitude at more than 40 separate stations; has kept an exact itinerary by which the whole of his journey is being mapped on

the scale of an inch to a mile ; has fixed the site of several ancient places, and described remains and ruins which had escaped all former travellers; has given the best geological account hitherto furnished of this singularly elevated table-land ; and, lastly, by a well-conducted series of barometrical observations, he has measured the height above the sea of its various plains and mountain ranges, and has completed his work by successfully carrying his barometer to the summit of Mount Argæus, and thereby being the first to prove that this mountain reaches the great elevation of 13,000 feet above the sea. Further to the east the astronomical positions determined by M. Fedorow in Ararat, and 14 points fixed by Captain Birdin of the Russian army in Caucasus and Asia Minor, have been examined by M. Struve and made public during the past year.* Of the routes followed by Captain Camille Callier, and M. Texier in 1833-4, nothing but a brief outline has yet been made public ; we learn that the map of the former on the scale of $\frac{1}{300000}$, or about eight inches and a half to the degree, has been commenced at Paris.†

Returning to the west, the survey of the coast of Anatolia under Lieut. Graves, R.N., assisted by Lieut. Brock, will shortly be united to that of Karamania by Captain Beaufort ; it is now advancing into the deep gulfs near Cos, Halicarnassus, and Cnidus, where all is classic ground, and every day throws fresh light on ancient history ; their researches also show not only where new marts may be opened to European commerce, but new paths for the progress of civilization, industry, and knowledge.

We are indebted to Mr. Brooke for an account of the little-known island and gulf of Symi which he visited in his yacht last year, and we learn that this spirited yacht-sailor is just on the point of starting to examine some of the numerous islands in the Indian Archipelago.

SYRIA.—Thanks to the expedition under Colonel Chesney and Mr. Ainsworth, we are here on known ground. In spite of climate, delays, and difficulties that would have deterred any but such resolute officers and men as composed this party, materials for a correct map of a large portion of Northern Syria have been collected ; a line of levels has been carried across from the Mediterranean to the Euphrates ; Northern Mesopotamia has been explored, and the survey of the great river Euphrates from Birehjik to its outlet in the Persian Gulf, a distance, including windings, of about 1200 miles, has been effected. We have thus a certain base line extending in a north-west and south-east direction through 7° of latitude and 12° of longitude, from Isken-derûn to Basrah, whence all future travellers may confidently take

* Bull. de l'Acad. de St. Petersburg, vol. ii., p. 219.

† Notice Ann. par M. Noel Desvigners, p. 280.

their departure when exploring either to the northward or southward of this line, and remember with gratitude what they owe to their countryman Lieut. Murphy, of the Royal Engineers, whose life fell a sacrifice to his exertions, and the climate, at Basrah.

A summary of the Euphrates Expedition, giving an outline of its most important features, has been published in this Journal,* while the more detailed narrative of its various incidents is preparing to meet the anxiety which the public naturally feels in an enterprise which was, in many points of view, one of the most interesting that ever left the British shores.

It were hardly necessary to add that the Royal premium "for the promotion of geographical science and discovery" has been awarded to Colonel Chesney, R.A., as leader of this expedition. Some valuable notes on the comparative geography of the Cilician and Syrian Gates by Mr. Ainsworth, and a memoir on the Bay of Antioch, and on the ruins of Seleucia Pieria by Colonel Chesney, clear up many of our former difficulties in reading the ancient accounts of the celebrated battle of Issus.

PALESTINE.—A remarkable point in physical geography has been here brought to light by the praiseworthy researches of Mr. G. Moore and Mr. Beek, who during the spring of the past year examined part of the shores of the Dead Sea, and carried a line of soundings across it; in the course of their examination they found, by the temperature of boiling water, that the level of the Dead Sea was 500 feet *below* the level of the Mediterranean. The truth of their experiments has been proved by the results obtained barometrically by Professor Schubert of Munich, who has lately found the lake of Tiberias to be 500 feet, and the Dead Sea to be 598 feet *below* the Mediterranean.† This is so remarkable a fact that we hope some traveller, supplied with good instruments, will soon visit Palestine to determine the level of this inland sea, and then explore the country southward along the valleys of El Ghor and El Arabah, a direct distance of only 100 miles, to the Gulf of Akabah, at the head of the Red Sea.

AFRICA.

The compact and unbroken mass of this great continent, where no deep gulf or navigable river of easy access opens a road into the interior for commerce and civilization, seems to offer an insurmountable barrier to the progress of discovery; nor can we say that geographical investigation has advanced more than a few steps beyond its coasts during the past year.

NORTHERN AFRICA.—Some few of the notes made by our

* Vol. vii. p. 411

† Allgemeine Zeitung, Nos. 83 and 109.

lamented countryman, Davidson, while in the city of Marocco and at Wad-Nún, in addition to those published last year,* have reached England. We had confidently hoped ere this to have heard of the arrival of Abú Bekr, his travelling companion, at Tumbúktú, but at the date of the last dispatches the return *cafilah* had not reached Mogador.

A valuable paper on the names of places in the empire of Marocco, written in the Arabic character, has been contributed to the *Journal* by our zealous honorary member, Count Gräberg de Hemsö. When we consider the barbarous orthography that disgraces all our maps of Africa, and of the East, we look upon this attempt to introduce a system of spelling according to a fixed standard as one of the most useful works that has yet appeared in our pages. If the Geographical Societies of Paris, of Berlin, of Frankfort, and of Bombay, could be induced to adopt some general standard for the orthography of Arabic, Turkish, and Persian names, perhaps all geographers, even if they might not fully approve of it, would for utility's sake adopt it.

The chart of the western coast of Marocco from Cape Spartel to Cape Bojador, from the survey of the late Lieutenant Arlett, R.N., are just published, at the Hydrographic Office, on the scale of eight inches to a degree; while to the southward, as far as Cape Verd, being chiefly the sea-coast of the Sahara, or great desert, the charts are engraved on one-fourth of the above scale, or four inches to a degree. Captain Vidal, R.N., during the past year has completed the survey of the Canary Islands.

ALGIERS.—The rapidly growing intercourse between France and her recent conquest in Africa promises to make us much better acquainted with this territory. An excellent account of the route pursued by the French army in its advance upon *Kostantinah* from Bonah by Sir Grenville Temple and his companion, M. de Falbe, has been kindly communicated to the *Geographical Journal*.† In this valuable report great attention has been paid to the Arabic orthography in the names of places, which so usually disfigure our maps; the sites of ancient cities are noticed, the physical geography of the country is well described, and a series of barometrical measurements gives us the height of thirty-one points, among which we learn that the city of *Kostantinah* stands 2900 feet above the sea. In addition to this, M. Dureau de la Malle has, in an able essay,‡ examined the ancient writers on the subject of Numidia, and shown where it is desirable to make researches, in order to throw light on its comparative geography.

A full report also has been given to the French government on the present state and resources of the newly-acquired province.

* *Journal*, vol. vii. p. 144.

† Vol. viii. pp. 39 and 124.

‡ *Province de Constantine*, p. 125.

The officers of engineers have made a detailed plan of the city of Kōstantīnah; some of the exploring parties have pushed forward to the south-west, while others have explored a more direct road from the capital to the sea-coast at Storah. M. Dureau de la Malle has very opportunely published the travels of Peyssonnel and Desfontaines in the regencies of Tunis and Algiers, in the years 1784-6.* Colonel Harding, R.E., has communicated to the Society his journal† of a route to Kōstantīnah in 1820; and lastly, the Dépôt de la Marine has published the beautiful charts of the north coast of Africa from Cape Serrát in 9° 12' E., to the Ja'farīn Islands in 2° 26' W., a direct distance of more than 600 miles.

At Carthage, Sir G. Temple and M. de Falbe are actively employed in exploring the ruins of the ancient city, and have been successful in bringing some inscriptions to light; the latter officer has lately made an excursion into the interior of the Beylik, in order to fix positions of some few places.

EGYPT.—Mr. Wilkinson's admirable work on the 'Manners and Customs of the Ancient Egyptians,' and Mr. Hoskins' 'Visit to the Great Oasis in the Libyan Desert,' are the two principal works on Egypt during the past year.

ABYSSINIA.—A letter from M. J. Russegger, chief of the Austrian mining expedition, dated Roserres, in lat. 12° 3' N., in the country of Fasoglo, on the south-western frontier of Abyssinia, Dec. 19, 1837, gives us the most recent and best account of the progress of discovery in this quarter.‡ From a former journey into the country of the Nuba negroes, south of Kordofan, M. Russegger has reason to believe that the existence of the Jebel Kúmri, or Mountains of the Moon, in the position in which they are marked in our maps, is very problematical; and, with respect to the Bahr-el-Abiad, or White River, he believes that it flows in a direction contrary to that assigned in our maps, for it rises in the country of the Galla and Shangalla, and flows parallel to the Bahr-el-Azrek, or Blue River. M. Russegger also mentions many discoveries in mineralogy; and that he was shortly about to start on his second journey to the south, with the hope of reaching Fadassi, in the country of the Galla, whither no European has yet advanced. We heartily wish success to this spirited traveller.

We still anxiously expect the account of Dr. Rüppell's late journeys in this country; in the mean time, the travels of MM. Tamisier and Combes, mentioned in our last year's 'Sketch,' have been published at Paris. The survey of the north-eastern

* 2 vols. 8vo. Paris, May, 1838.

† MS. in library.

‡ Athenæum, No. 549. A periodical in which the most recent and accurate geographical information will usually be found.

extreme of Africa, by the officers of the Indian navy, is advancing to Cape Gardafui, but the details have not reached this country.

WESTERN AFRICA.—Traversing the continent in this parallel we reach the Bight of Benin, to which the survey of the Ashánti coast will shortly extend. This tedious undertaking is now drawing to a close, and will then be of equal utility to the fair traders and to the anti-slavery cruisers. It is fortunately in the hands of such a man as Captain Vidal, R.N., who has steadily devoted himself during a long period of ill health to complete this unpopular work, and to connect with it a minute examination of the Canary Islands.

This gigantic survey, embracing the east and west coasts of Africa, from the Isthmus of Suez [Suweis] round by the Cape of Good Hope to the Pillars of Hercules, may be said to have been drawn and coloured with drops of blood. Twice did Captain Owen change his whole crew and officers; those accomplished surveyors, Captains Boteler and Skyring, fell a sacrifice during its progress, and now, in the hour of conclusion, the crews of the *Etna* and *Raven* have all but shared the same fate.

An account of Messrs. Oldfield and Becroft's ascent of the Old Calabar River will be found in the *Geographical Journal*, and we learn that Mr. Becroft has just returned from his fourth ascent of the River Quorra [Kawára], during which he found the natives very peaceable and well disposed to trade.

During the past year, the narrative of Mr. M'Gregor Laird, and Mr. Oldfield's ascent of this great river, in 1833, has been made public. It contains the full details of their voyage, related in a simple, straightforward manner, with a useful appendix by Mr. Laird, on the best means of establishing a trade with the interior of these countries, and the probable chance of success.

SOUTH AFRICA.—The important journey from which Captain Alexander is just returned, to the north-west of the Cape colony, through the country of the Great Namáguas, Boschmans, and Hill Dámaras, offers a route of 1500 miles, which has never appeared in any former map of Southern Africa. Crossing the Orange River at about 100 miles from its mouth, the traveller proceeded to the north-east as far as Nabis, the last missionary station; thence to the north-west, crossing the 'Oup or Great Fish River, in the parallel of 27° nearly; then, inclining to the northwards, he traversed many of its western tributaries, and reached the Kei Kaap or Great Flat, over which he and his party journeyed as far as the Kópumnaas or Bull's Mouth Pass, a remarkable defile, in the parallel of 24° , winding, for a distance of 40 miles, between mountains of from 2000 to 3000 feet elevation; he then emerged on the Great Desert of Tans, on the verge of the tropic, where the whole party nearly perished for want of water. Overcoming this difficulty, they reached the

banks of the River Kúisíp, and followed its western course to the sea, at Walvisch Bay, in lat. $22^{\circ} 52\frac{1}{2}'$, being the first Europeans that had reached it by land from the Cape of Good Hope. Quitting the sea-coast Capt. Alexander ascended the bed of the Kúisíp River in an east direction about 200 miles, to a large village named Ni-ais, inhabited by Dámaras of the Hills, situated in a fertile, well-watered country, abounding in cattle. From this point the expedition turned to the southward, crossed many of the western affluents of the Great Fish River, reached the Orange River at about 40 miles from its mouth, and returned to the Cape of Good Hope, after an absence of one year and ten days, bringing with them a large collection in natural history.

As before mentioned, this journey fills up a great blank in the south-western portion of Africa, and much credit is due to Captain Alexander for his perseverance in carrying through an expedition which throughout was exposed to very great privations and hardships. The information brought home also is highly important as establishing the fact of a station in the interior 200 miles from the coast, situated in a fertile country, inhabited by friendly natives, easily accessible by a few days' journey from Walvisch Bay, and in every respect affording all we could desire as a starting point to enable future travellers to traverse the continent of Africa in the parallel of 23° , and thus connect Captain Alexander's discoveries on the west with the labours of Dr. Andrew Smith, who reached the tropic in the year 1835, only 300 miles farther to the east.

The enterprising spirit of the frontier boors of the Cape colony, their roving habits, and circumstances resulting from the late Káfir war, have combined to cause a tide of emigration to set towards the north-east in a manner unknown in the annals of colonial history. A body of 5000 farmers, including their families, with cattle and sheep to a very great amount, have left the colony with the intention of establishing themselves wherever they can find a suitable place beyond its boundary. At first they pushed their exploring parties within a few days' journey of Delagoa Bay; but, from the latest accounts, they seem to have established themselves about the parallel of Port Natal, to the west of the Quathlamba range of mountains, through which, it appears, they have found a passage, and sent a large body of their delegates to the settlement at Port Natal. This irruption must shortly lead to a far better acquaintance with the geography of this portion of Africa.

AMERICA.

Traversing the Atlantic Ocean to the western hemisphere, we naturally follow the course of Captain Back in H.M.S. Terror, and, after reading his vivid description of the extraordinary circumstances that befel him and his crew in Hudson's Straits, and their

providential escape from a ten months' imprisonment in the ice, we must feel thankful for their preservation, rather than regret that, on this occasion, the physical obstacles which were opposed to their progress were insurmountable; yet, although the main object was not accomplished, the voyage was far from being barren in results; and the examination of 120 miles of the north-eastern shore of Southampton Island, from Cape Comfort to Seahorse Point, now for the first time laid down on our charts by Lieutenant Owen Stanley, is a proof that, even when drifted along at the mercy of a field of ice, an experienced observer will turn his opportunities to advantage: also, the very fact of the continued drift to the eastward is a strong argument in favour of the existence of the passage which the Rosses, Parry, Franklin, and Back, have successively gone in search of.

As if to compensate for the want of success in this attempt, our enterprising countrymen, Messrs. Dease and Simpson, two officers of the Hudson Bay Company's service, have succeeded, during the past summer, in tracing the hitherto unexplored country between Point Barrow and Franklin's Farthest; and thus a continuous line, of 60 degrees in extent, of the northern coast of America, from Point Turnagain, on the east, to Behring's Straits, on the west, has been explored by British hardihood and perseverance. The simple narrative of the gentlemen who conducted this expedition, so honourable to British commercial enterprise, has been promptly communicated to the Society by the governors of the Hudson Bay Company; and, from the excellent instructions drawn up by the resident governor Simpson, and from the perseverance and energy of their officers, we have every hope that Messrs. Dease and Simpson may succeed in tracing the 220 miles of still unexplored coast between Point Turnagain and Captain James Ross's Farthest, and thus accomplish the glorious task of determining the northern limits of the great continent of America.

The recent publication of the work named '*ANTIQUITATES AMERICANÆ*,' which does great honour to the Royal Society of Northern Antiquaries at Copenhagen, has proved the discovery of America by the Scandinavians or Northmen in the tenth century. As such a subject must deeply interest all those who occupy themselves with ancient discoveries in geography and history, and as from the nature of the work its circulation will be extremely limited, it has been considered that an abstract of the historical evidence would appropriately find its place in our Journal.* From these documents it appears, that in the year 1003 the coasts of Connecticut and New York were examined, and probably also those of New Jersey, Delaware, and Maryland.

CANADA.—The charts resulting from the survey of the river

* Vol. viii. p. 114.

St. Lawrence from Quebec to its mouth, by Captain Bayfield, R.N., were published last year; and the surveyors are now completing the gulf of St. Lawrence, as well as the upper river from Quebec to Montreal. All that has been surveyed has been given to the public in upwards of forty sheets.

NEWFOUNDLAND.—The Dépôt de la Marine has published sailing directions for the eastern coast of this island, from Cape Bonavista northwards to Cape Norman, at the entrance of the straits of Belleisle, drawn up by Captain Lavaud; but the portion recently examined by this officer extends only from Cape St. John, in lat. $49^{\circ} 57\frac{1}{4}'$, the limit of the French fisheries on this coast, to Cape Norman in $51^{\circ} 37' N.$ *

UNITED STATES.—Of the progress of the survey under Mr. Hassler we have no recent accounts. Of the more western portions of this country, and especially of its natural history, we have a description in the work of Prince Maximilian Wied of Neuwied, whose travels along the banks of the Missouri, to the foot of the Rocky Mountains, are now publishing at Coblenz. Two numbers are on sale; and, to judge of the illustrations by some of the spirited original sketches which Mr. Charles Bodmer, a German artist, who accompanied the prince, has obligingly exhibited at the Geographical Society, it will add greatly to our acquaintance with the features of the fast-perishing Indian races.

The American Portfolio, now publishing in London, is also in this respect a highly valuable work; the portraits of the native chiefs are beautifully drawn and coloured, and the biographical sketches well and simply written.

We learn that Long's Peak, in lat. $40^{\circ} N.$, long. $106^{\circ} W.$ nearly, one of the range of the Rocky Mountains, has lately been measured, and found to reach 15,000 feet above the sea, but we have not been able to meet with any account of the measurement.

No detailed accounts of the operations of the survey of the western coast of America, under Captain Belcher, R.N., have been received, but there is good reason to believe that it is proceeding with energy.

This officer has lately visited the Russian port of Sitka, where there is an excellent arsenal well found in naval and military stores; and where he was received with every mark of friendly assistance. On his voyage thither he obtained a measurement of Mount St. Elias, which was also measured by Malaspina, in the voyage of the *Atrevida*, and found it to reach 15,000 feet above the sea.

SOUTH AMERICA.—Besides his admirable *Examen Critique*, Baron Humboldt has lately published a valuable notice, *Sur quelques Points Importans de la Géographie de la Guyane*, in which he briefly reviews all that was formerly known and has

* *Annales Maritimes*, Dec. 1837, p. 1231.

lately been discovered in this extensive tract of country north of the Amazons, chiefly with the object of keeping in view the bases on which the maps rest of the northern portion of South America; for, as he truly remarks, nothing is more important in astronomical geography than obtaining accurately such *data* and the knowledge of observations upon which they depend.

An interesting narrative, by Baron Humboldt, of two attempts to ascend Chimborazo in 1802, has appeared in No. 51 of the Edinburgh Philosophical Journal.

During the past year Mr. Schomburgk, our traveller in British Guayana, has explored the rivers Corentyn and Berbice, a detailed report of which appears in vol. vii. of the Journal. Since his return, this persevering traveller has again ascended the Essequibo to its junction with the river Rupunúny; following the upward course of the latter he ascended its tributaries, the Rewa and Quitaro, and on the 17th Nov. 1837, the date of his last letters, he had reached the latitude of $2^{\circ} 31' N.$, some miles beyond his extreme point on the former expedition, and was then about to start to explore the mountain range of the Sierra Acaray, and to connect, if possible, his observations with those of Baron Humboldt at Esmeralda on the Oronoco, already connected with Guayaquil on the Pacific; and thereby to determine the true breadth of the American continent, between Guayaquil and Demerara on the Atlantic ocean.

That enterprising traveller, Mr. Hillhouse, has also explored more than two hundred miles of the river Cuyuny.

BUENOS AYRES.—Don Pedro de Angelis continues his publication of official documents relative to the history and geography of the provinces of La Plata. The fifth volume complete, and part of the sixth, have appeared since last year, and it is probable that the whole work will not be less than ten volumes.

In the fifth volume an account is given of the several missionary settlements formerly dependent on the College de Propaganda Fide of Tarija, situated between $18^{\circ} 40'$, and $23^{\circ} 15' S.$ lat., and important in a geographical point of view, as commanding the navigation of the two great rivers, the Rio Grande or Guapey of Santa Cruz de la Sierra, which runs into the Madeira, and the Pilcomayo, supposed to be navigable to the Paraguay. The account is dated 1800, and is drawn up by the Prefect of the Department for the information of the Governor of Potosi: it gives the geographical position of twenty-one points.

In the same volume is an interesting collection of records of expeditions undertaken by the Spaniards in the last century, to explore the Pampas to the south of Buenos Ayres, and to examine the coast of Patagonia. In these papers there is much information quite new to us respecting those parts, and the settlements

formed on the coast of Patagonia about the year 1779, and afterwards abandoned by the Spaniards.

The sixth volume contains a table, never before published, of positions fixed by Malaspina, on the northern and southern shores of La Plata, in his voyage with the *Atrevida* and *Descubierta*.

A diary, by Viedma, of the expedition to form the settlement at San Julian's, on the coast of Patagonia, in 1778.

A survey of the frontier towns and forts of the province of Buenos Ayres, by Don Felix de Azara, in 1796, determining by observation the positions of all the principal towns in that province; and a variety of papers connected with the advancement of the frontiers of that state, into the territory formerly possessed by the Indians to the south; all which will be of great utility in assisting the geographer to fix more correctly the physical features of a considerable portion of the South American continent as yet very imperfectly laid down in our maps.*

Señor de Angelis deserves the highest praise for the zeal and ability with which, under very difficult circumstances, as we are told, he labours to make this collection as complete as possible. It is of equal importance to the historian and to the geographer, and we can well recommend it to all those who are interested in South America.

Thirty-two livraisons of M. Alcide d'Orbigny's beautiful work on the natural history of the republic of La Plata and the Banda Oriental are now published; in Mr. Scarlett's recent *Travels in South America* will be found some new information relative to Paytá, and a full statement of the proposed plan for steam navigation from Chile to Panama.

We anxiously look for the detailed account of the survey of the coasts of Patagonia, Chile, and Peru, by Captain Fitz Roy, in H.M.S. *Beagle*. The map of South America to illustrate the work, by Mr. John Arrowsmith, just ready, is compiled from the most authentic sources, and contains all that is known of that country. We are glad to see that the geographical positions determined in the voyage of the *Beagle* have been republished in German and in French; as, however, in the *Additions* to the *Connaissance des Temps* for 1840, Captain Fitz Roy's longitude of Iquique, in Peru, is rejected as being seven or eight miles in error, it is necessary to state that its position, as given in this *Journal*, vol. vi. p. 338, depends upon three independent chronometric measurements between Valparaiso and Lima; and we therefore venture to caution navigators against trusting to any other longitude than that determined in the late voyage of the *Beagle*.

* The writer is indebted to Sir Woodbine Parish for the chief part of the information relating to Buenos Ayres.

AUSTRALIA.

NEW SOUTH WALES.—A summary of the last journey of Major Mitchell, surveyor-general of this colony, with a map of his discoveries in the country named by him *Australia Felix*, was published in vol. vii. of our Journal; the detailed narrative of this and of Major Mitchell's two former expeditions into the interior will shortly be made public. A map of the colony of New South Wales, by Major Mitchell, on the scale of eight inches to a degree, drawn and *engraved* at Sydney, represents, better than any other we have seen, the great physical features that mark the face of the country.

At Port Phillip a town named Melbourne has been founded at the north-eastern angle of the bay, and from the latest accounts is rapidly increasing in population and in flocks and herds, as the country is found admirably adapted for pasturage.

SOUTH COAST.—The colony established on the east side of St. Vincent's Gulf have laid the foundation of a town called Adelaide, and cheering accounts of its prospects and of the nature of the surrounding country have been received; an exploring party have made their way a short distance to the northward, and also across to the eastward through the Mount Lofty range as far as Lake Alexandrina; and while we write [May 19] the news has reached London that the river Murray has been found to discharge itself into the sea in Encounter Bay by a wide navigable mouth, four fathoms deep at the entrance, some miles to the eastward of Lake Alexandrina, through the eastern portion of which lake the river appears to hold its course.

NORTH-WEST COAST.—The expedition, under Lieutenants Grey and Lushington, for exploring this most promising portion of the coast of Australia, sailed from the Cape on the 5th October direct for its destination, since which no accounts have been received; up to that time all the party were sanguine of success, and had taken the most prudent measures to ensure it. Their intention was to convey the most useful animals, plants, and seeds from Brazil, the Cape, and Timor, in order to spread them in the interior, and thus to benefit the country by every means in their power. Most sincerely do we wish them success. The nautical part of the expedition, under command of Captain Wickham, R.N., would first visit Swan River, and then probably proceed to examine Dampier's Archipelago.

NORTH COAST.—The expedition to establish a settlement at Port Essington, on the north coast of Australia, sailed from England in the beginning of the year. It consisted of two vessels commanded by Sir Gordon Bremer and Lieutenant Owen Stanley, from whose experience as a surveyor may be expected much new hydrographical information.

An excellent map of the whole of Australia, in two sheets, on the scale of two inches to a degree, just completed by Mr. John Arrowsmith, is admirably engraved, and contains all the most recent discoveries in this quarter.

A paper, well worthy of serious consideration, on the geographical nomenclature of Australia, by Captain Vetch, R.E., is published in this volume of our Journal. It is to be hoped that all geographers, at least, will exert their influence in rescuing this country from the barbarous nomenclature that is daily gaining ground in it; and which, if not checked at once, will become so firmly established, that it will be nearly impossible to eradicate it.

POLYNESIA.

Parts of the western shores of New Guinea, and of the Archipelago of the Moluccas, have been examined by MM. Kolff and Modera, officers of the Dutch navy, and an analysis of both their voyages will be found in the Journal of the past year.

The Hydrographic Office has recently published a chart of the Arafúra Sea, a book of sailing directions, compiled by Mr. Windsor Earl from all the documents that were available: it is a great improvement upon all former charts of this sea, to which the name Arafúra has been given, as the numerous islands within its limits are chiefly inhabited by people of the Arafúra race.

The Dépôt de la Marine has just published a chart of the Indian Ocean, and also of the China Sea, compiled by M. Daussy; and the first volume of Horsburgh's Indian Directory, translated by Captain Prédour.

Mr. F. D. Bennett has given us some new information respecting the Marquesas and other groups in the Pacific Ocean, and has corrected the position of the Lobos, Guadalupe, and Rotch's Island.* The Actæon has fixed the position of a group of three islands discovered by Mr. Ebrill in the Dangerous Archipelago;† and Mr. Williams‡ affords us much new information respecting the little-known group of the Navigator's Isles. But we trust that the expedition which has just sailed from the United States will, ere long, accurately determine the positions of the numerous groups and islands in the Pacific Ocean.

The omission of any notice of the geographical distribution of animals and plants will strike the most cursory reader of this Sketch; but we can only refer to the names of Richardson, Swainson, and Watson, in our own country—of Meyen, Canstein, C. L. Buonaparte, and doubtless many others in different parts of Europe—and plead ignorance and want of time to search for information on the subject. Yet, on one point we must ven-

* Journal, vol. vii. p. 211.

† Ibid. p. 455.

‡ Missionary Enterprises.

ture to add a few words, not with the most remote idea of doing justice to the subject, but with the hope of inducing those who take an interest in geography to turn their attention to one of the most important branches of strictly geographical inquiry.

ETHNOGRAPHY.—In attempting a brief outline of the recent progress of ethnographical research, it may be remarked that some new light has been thrown on the ethnography of Europe, and on the history and mutual relations of the different races of people who inhabit this part of the world, by researches into the intimate structure and affinities of their languages. Such researches have been conducted of late in a far more accurate and analytical manner than formerly. The *Deutsche Grammatik* of Jacob Grimm may be instanced as the most complete and elaborate analysis ever published of any one class of languages. This work has lately been completed by the appearance of the fourth and last volume; and the object of the distinguished writer has been to display the relations of all the dialects of the Teutonic speech with each other and with other languages of Europe and Asia.*

The history of the Indo-German languages has also been elucidated by the late works of Professor Bopp, who in his '*Vergleichungs-Grammatik*' has completed the task which he commenced some years ago. Dr. Prichard's work on the 'Origin of the Celtic Nations' is the first in which the question whether the Celtic dialects belong to the class of Indo-European languages was fully examined; and, in the opinion of all those who have considered the evidence which he has adduced, the question has been completely solved. A similar result has been obtained by M. Adolph Pictet, of Geneva, in a treatise more recently published on the same question.

The antiquities of the ancient Iberi, whose descendants speak the Biscayan or Basque in Spain and France, has been elucidated by Baron W. von Humboldt, in a work which is a model for researches of this description.† On the relations of the Basque to the American languages, some valuable observations are to be found in the late work of M. Abbadie.‡

The northern languages, and the history of the nations in the north of Europe and Asia, are subjects which have been investigated by Danish, Swedish, Finnish, and Russian philologists and antiquarians, whose works are less read in this country than they deserve to be. Professor Rask, of Copenhagen, was one of the most distinguished of these writers, and his premature death has been a great calamity to this department of literature. His work

* The writer is indebted to an author who has proved himself to be intimately acquainted with the subject of ethnography, for the notes from which the chief part of the above information is extracted.

† Prüfung der Untersuchungen über die Urbewohner Hispaniens, von W. von Humboldt. 4to. Berlin.

‡ Etudes Grammaticales de la langue Euskarienne, par M. d'Abbadie. Paris.

on the northern languages contains much valuable information on the history not only of the Scandinavian idioms, but also on those of the Finnish and Lapponic races.*

The lights reflected from different objects in this field of research have been condensed by Dr. Müller in his treatise entitled "*Der Ugrische Volksstamm.*" In this work the author makes geography the groundwork of his researches, and follows the method pointed out by Professor Ritter in his admirable "*Erdkunde.*" The volume already published comprises an extensive survey of the Uralian countries and their primitive inhabitants. A view of Caucasus and the Altaic chain is to be the subject of a succeeding volume. The author agrees with Klaproth and other late writers in reprehending the application of the term Caucasian to the principal races of Europe and southern Asia. The true Caucasian nations constitute in fact a very peculiar group, most of them being entirely distinct from the nations termed by Eichhorn "Semitic." The Caucasian tribes, as it will perhaps be hereafter generally acknowledged, betray much greater signs of affinity, though this is but a remote one, with the Uralian nations and with others in the north of Asia. Erman, in his "*Reise um die Erde,*" has collected information which tends to elucidate the history and relations of many of these widely-scattered tribes. His researches are particularly interesting in one point of view by the indications of ancient affinity, or at least of early intercourse, which he has detected between the inhabitants of the north-western coast of America and the northern Asiatics. The forms of words, in his short collection of Ostiak words, and particularly the termination of nouns of number in *all*, remind us of the old Aztec, in which (as well as in the vocabularies of the tribes who dwell in the north-western tracts of America, in the ancient Aztlan, and in the path of emigration said to have been followed by the roving Toltecas) this combination of elements occurs in almost every third or fourth word.

AMERICA.—The ethnography of the New World, and the history of its languages, occupy the attention of distinguished writers in the United States. M. Duponceau, the venerable President of the American Philosophical Academy, has excited the interest of his countrymen to these researches, and Mr. Pickering, of Boston, has devoted his talents and the leisure which his active profession allows him to the task of preserving an impress of the thoughts and feelings of races of men who appear destined soon to become extinct.† The publication of a memoir on the Othomi language by Naxera, under the auspices of M. Duponceau, affords the first

* Raak über die alten Nordischen Sprachen.

† See Mr. Pickering's notes and publication of Rasles' Dictionary of the Abnaki Language, in the Memoirs of the American Academy of Arts and Sciences, new series, vol. i. 4to. Cambridge. 1833.

instance, and that a very curious one, of the discovery of a monosyllabic language in the heart of America. Till now the exclusive possession of monosyllabic languages had formed one of the strongest features of contrast by which the eastern Asiatics were distinguished from the inhabitants of the New World. A fact of some interest is the late invention of a new character adapted to the language of the Cherokees by a native of that race, educated in one of the colleges of the United States. In this character, of which the inventor has procured type, he publishes for the use of his countrymen a newspaper, well composed and edited, partly in English and partly in the native idiom of the red-skinned tribe.

POLYNESIA.—Of the ethnography of the insular natives of the southern ocean, the first sketch was drawn by Forster, the companion of Cook. By this eminent naturalist the natives of all the groups of isles of the southern seas from Madagascar to Easter Island were referred to two races, which have been termed the Papuan and the Polynesian. The opinion of Forster was adopted by Marsden, and has been followed by many writers; but late discoveries, and particularly those which have been occasioned by the late French expeditions sent out under Captains De Freycinet, D'Urville, and Duperrey, have proved that Forster's conclusions were, as might be expected, far too general, and that they require great modification. It seems to result from these later investigations that the aborigines, or at least the oldest known inhabitants of the larger islands in the Austral seas, as of Borneo, Celebes, New Guinea, New Britain, and New Ireland, are not Papuas or woolly-haired races, but tribes termed in many places *Alfúrus* or *Arafúras*, who have straight hair, and who in physical character resemble the Australians.*

The Australians often are considered to be a branch of this division of mankind, and it becomes a question of great interest how far they may hereafter be identified with the *Arafúra* tribes by an examination of their languages. For such a comparison resources are yet wanting. By the missionary Threlkeld materials have been collected which afford access to the language of one Australian tribe, and these may hereafter furnish an opportunity of comparing this with other dialects. It is very desirable that this example should be imitated. On the southern coast and in the interior of New Guinea it is very probable that idioms akin to those of the Australian savages may be discovered. The northern coast of that great island is occupied by Papua, or black and woolly-haired tribes, who issuing from some unknown centre have spread themselves over the coasts of most of the larger, and have gained entire possession of some of the smaller, groups in the Indian and Pacific oceans. The era of their migration cannot

* In the first vol. of Dr. Prichard's *Researches* are given drawings of the skulls of *Arafúras*, who are there described as a distinct section of the human species.

be ascertained, but many circumstances seem to countenance the opinion of M. Lesson that it was long posterior to the dispersion of the Arafúras over the same countries, and even to that of the Polynesians. M. Lesson has attempted to distinguish several separate races among the tribes who are commonly included under that collective name, but the marks of discrimination on which he relies are deserving of less confidence than those which are founded on the affinity and diversity of language.* To this last circumstance M. D'Urville has directed his attention with greater success than any other writer among the late editors of the French voyages to the Pacific. His two volumes of philology connected with the narrative of the voyage of the *Astrolabe*, contain some valuable additions to the stock of information previously acquired, and the results which arise from a comparison of copious vocabularies are deduced with great ability.† They coincide, in their general tendency, with information conveyed in a later work, the publication of which forms an era in the history of Polynesian ethnography. We allude to the work of Wilhelm von Humboldt,‡ which treats professedly on the Kawi language in the isle of Java, a work of multifarious erudition, and one which displays a rare union of the powers of philosophical investigation with the clear discernment and comprehensive judgment of the statesman and man of the world.

In this work, not the Kawi language in particular, but the theory of language in general, has been elucidated; light also has been thrown on the history of the Oceanic nations in a comprehensive view; the revolutions have been traced which changed the old Polynesian inhabitants of Java into a comparatively refined people, speaking a language altered to, and greatly modified by, the sacred idiom of the Brahmins; and an insight has been opened into a still more remarkable connexion between the original basis of language among the Malaya islanders and the natives of the Indian continent. With respect to the population of the Philippines and of Madagascar, both D'Urville and Humboldt agree in one opinion, which is contrary to that generally prevalent in this country. It seems that the aboriginal people of the last-mentioned islands, the Ovahs, are so nearly allied to the race in Sumatra (who are the primitive Malays), and both nations to the Tagalas of the Philippines, that all of them may be almost termed one people, and considered as speaking proximate dialects of one language, whereas, it has been stated as the opinion of Mr. Craw-

* See a variety of *Memoirs*, by M. Lesson, in the *Annales des Sciences Naturelles*, and the first and second volumes of his admirable *Supplements to Buffon's Hist. Naturelle*.

† *Voyage de l'Astrolabe, Partie Philologique*, par le Capitaine Dumont d'Urville. Paris.

‡ *Über die Kawi-Sprache auf der Insel Java, &c.* Von W. von Humboldt. Berlin, 1836.

ford, that the Polynesians of Madagascar are only accidental colonists of the shores of that island, and that the central parts were inhabited by people of a widely-different character, both physical and moral.

AFRICA.—On this, the most difficult region of ethnography, inasmuch as it is the least explored, we have just received the second volume of Dr. Prichard's admirable work, containing *Researches into the Physical Ethnography of the African races*, in which the author has, in a masterly and comprehensive manner, classified all the existing materials that could be obtained by diligent research, and fairly stated the conclusions resulting from them. In treating his subject, Dr. Prichard divides the population of Africa into different groups of nations, associated by analogies in their languages more or less pronounced; and, where information fails for such a principle of arrangement, by general features of resemblance physical and moral. Some of the principal groups are—1. The Atlantic nations, including all the Libyan tribes who speak dialects of the Berber, and, among these, the ancient Guanches. The author has compared the latest accounts of these tribes as given by Rozel, who accompanied the French expedition, and the information derived from a Notice on the Empire of Marocco in vol. i. of this Journal. 2. The nations of Senegambia, who inhabit the elevated plateau whence the great rivers of Western Africa take their rise. He has collected information from various quarters illustrative of the history of the Mandingos and the Fúlahs. 3. The maritime nations of Guinea, whose languages form one group of African idioms. 4. The nations of Sudán, first described by Ibn Batuta and Leo Africanus, differing in physical character and in their languages from the preceding. 5. Abyssinian, or straight-haired races, in the east of Africa, including numerous native African tribes extended over a great part of the continent, but chiefly inhabiting highlands. The Habesh of Tigre are distinguished from all these as an Asiatic colony. The author enters into an historical inquiry respecting the era of their colonisation, and connects them with the Arabs of Hamyar, or the Homerites of the Byzantine writers. In pp. 152, 153, he brings arguments to prove that the Abyssinian alphabet was derived from the Hamyarites, and not invented by the first Christian missionaries at Axum, as Michaelis and other biblical writers have supposed; and here we may observe that it has been discovered by Lieutenant Wellsted that such was precisely the fact.

The letters of the Abyssinians, or characters nearly resembling them, have been used of old by the Hamyarites, and this discovery, anticipated from a survey of historical probabilities, made by a British naval officer, has put an end to a controversy long agitated among the European literati, as to the era and manner in

which the Abyssinians came to be possessed of the art of writing: Bruce strenuously asserted the high antiquity of the Ghíz alphabet, but he was opposed by the majority of learned men in Germany. 6. A sixth class are the Nuba races, an extensive group of nations, whose native region, the cradle of their national existence, is the northern slope of the great table-land of Habesk, and the banks of the great rivers which descend from it. This group contains races in which the negro type becomes gradually evanescent, till it fades away in the Berábera of the upper Nile, thus affording one instance of facts of which Dr. Prichard is in quest, viz. of the transition from the character of the negro races into those which belong to other divisions of mankind. In this argument he takes great advantage of the observations of Dr. Rüppell. To the last-mentioned group the author adds the ancient Egyptians, whose history, and that of their three dialects, he has carefully traced. He seems in some way to connect them with the Nubian group, though he considers them as quite distinct from the Berábera. 7. The South African nations, meaning all those tribes who display in their languages any sort of relation to the Kaffirs, occupy, in the development of their history, a considerable part of this volume, and in this part of it the author has collected all the information within reach relative to African philology. This he thinks sufficient to support him in laying down the genuine African languages as a distinct class of human idioms, all related to each other by certain grammatical peculiarities, of which the idioms of Congo, of Kaffirland, and of the Mozambique country partake, and which may even be traced in the dialects of the old Egyptian. Whether the data on which these conclusions rest will be thought adequate by the learned remains to be discovered: the subject is worthy of investigation. As far as the South African nations, as above distinguished, are concerned, there seems to be sufficient evidence of a real affinity of language, such as denotes either consanguinity in the races to which they belong, or a very ancient intercourse and intimate connexion. 8. The last group are the Hottentots. The author concludes his work with general observations on the physical history of the African nations, and a discussion of the question which refers to their alleged inferiority in intellectual power.

In conclusion, it may be observed, that all travellers in new countries can materially assist the researches of the eminent men whose works have been mentioned, by collecting accurate vocabularies of the language or dialect spoken in the regions they may traverse. Surely, too, when its importance is so manifest, this will not be thought too great a task to be undertaken, and vigorously prosecuted, by all who are concerned in the promotion of the most interesting branch of geographical inquiry.

XXI.—*Narrative of a Journey from Mokhá to San'á by the Tarīk-esh-Shám, or Northern Route, in July and August, 1836.*
By Mr. CHARLES J. CRUTTENDEN, Indian Navy.

DURING the time that the East India Company's surveying brig *Palinurus* of the Indian Navy was employed at Mokhá in making a plan of the roadstead, Dr. Hulton, the surgeon of the vessel, and myself, took advantage of the opportunity thus offered to endeavour to penetrate as far as San'á. We had previously made the attempt from 'Aden, on the south coast of Arabia, but, owing to the suspicious temper of the Sultán, were unable to effect our purpose.

Lieutenant Wellsted, I.N., has already, I understand, laid before the Geographical Society copies of inscriptions found at Nakabu-l-Hajar,* and the Royal Asiatic Society have, I believe, published those found at Hīsn Ghoráb, on the southern coast of Arabia, and our pleasure was, of course, great in finding the very same characters in San'á. We were the more surprised at this discovery, as Niebuhr says he could hear of none at that place, though the buildings on which we found these were, by the accounts of the townspeople, at least seventy years old.

My original intention was merely to offer to the Geographical Society the copies of the inscriptions, and an account of the place where they were found. As, however, I understand that a narrative of my journey to San'á may be acceptable, I have given a few rough notes made during our progress across the mountains, which may serve to show the nature of the country, and the principal towns.

The inscriptions were found in the neighbourhood of the most ancient part of San'á, near the foot of Dár-el-Tawáshí, or the "Abode of the Eunuchs:" it is also sometimes called Bakhírf. It is the eastern extremity of the town, and in former days was the part appropriated to the Jews. The letters are about 2½ inches long; three of the inscriptions are in relief, and the fourth is cut into the marble.

These inscriptions are exactly in the same character as those found at Hīsn Ghoráb, about 70 miles to the westward of Makullah, on an almost insulated rock, on the south coast—as those at Nakabu-l-Hajar, in 14° 30' N. long. 46° E.—and as those of Nakhl Mayúk and Kōsair, about 70 miles to the eastward of Makullah—but the two latter are said to be in red paint.

Several of the principal merchants in San'á assured us that these stones had all been brought from Máreb, which was about

* Journal, vol. vii. p. 20.

two long days' journey distant; and, in reply to our questions, told us that it was less expensive to bring these ready-cut stones from Máreb than to prepare them in Šan'á. The fact of Máreb being still called by the natives "Ard-es-Sabà" (i.e. the land of Sheba),* leads to the supposition that this might be the ancient Saba, but of this hereafter.

We determined to adopt the native costume as being better adapted for travelling, and, through the kind assistance of a wealthy Persian merchant at Mokhá, we found no difficulty in procuring a guide and eight mules to take us to Šan'á. We were particularly anxious to take the eastern road, or "Tarík el Yemen," by Ta'ez and Dhamár," but the intestine feuds of the Bedawí sheikhs in that part rendered travelling impracticable, and indeed this road has been blocked up for eleven years.

July 13, 1836.—We quitted Mokhá at sunset, as, the hot season having commenced, we were compelled to cross Tehámeh by night, and travelled along the shores of the Red Sea in a northerly direction, about two miles from the beach. Our party consisted of Dr. Hulton, myself, two servants, who also acted as interpreters, and four muleteers, all well armed, as even in Tehámeh travelling by night is not considered altogether safe.

In that tract the caravan-serais, or, as they are here called, the "Mekhàyehs,"† are generally divided into several small apartments, each sufficiently furnished with rude wooden bedsteads, and small three-legged stools for coffee, &c. In the evening the inhabitants of these several chambers have their beds carried outside into the square court-yard, which forms the centre of the building, and placed in the open air, the weather being too oppressive to admit of any one's sleeping under cover.

The dews at night fall like rain, but, if the precaution is taken of covering the face with a light linen cloth, no evil effects result from the exposure, owing to the absence of trees; and the sensation of perfect refreshment that is experienced on rising is indescribable.

The "Mukawwí,"‡ or coffee-house-keeper, supplies his guests morning and evening with curdled milk and a coarse cake of Jowarí§ bread, which weighs about a pound, and is commonly called by the natives by the name of "one man's share." The whole cost of supper, breakfast, and a night's lodging, did not exceed a third of a dollar, or 1s. 6d., and there are stated prices

* Máreb was the capital of Sabá. "Saba cujus metropolis Márah. Mariaba: Strabo. Plin. &c., paulo plus triduo distans à Sanaa." Golius in Alpheran, p. 86.

† Properly Meháyí, plural of Mahyá; a living-place.

‡ The furnisher of refreshments. This word is not derived from Kahweh, coffee.

§ Sorghum vulgare, called *dhurrah* by the Arabs.

for every article of food. At this time grain had risen greatly in price, owing to the continued drought that had prevailed for nearly four years.

The scenes of misery and wretchedness which we witnessed on our passage across Tehámeh were dreadful. In Mokhá it was no uncommon thing to see dead bodies lying unheeded in the streets, victims of famine, and this, added to the grinding tyranny and brutal oppression of the Egyptian troops, rendered the condition of these poor people almost insupportable.

Our first stage was about fifteen miles to the small village of Ruweis,* where we halted till three o'clock on the following day. Thermometer in shade at 1 P.M. 96° Fahr.

July 14.—We pursued our route for about twenty miles, gradually diverging from the shore as far as Múshij, or Maushij,† a large village, containing perhaps eight hundred inhabitants, and celebrated for the quantity of “yásmín,” or jessamine, which grows there; its flower, stripped of its stalks, and strung upon thread, is daily carried to Mokhá, where it is eagerly purchased by the women as ornaments for their hair. In each thicket of jessamine there is a well of pure and sweet water, so that these bowers form a very delightful retreat during the intense heat of the day.

The mosque at Múshij is noted as being the favourite resort of the Imám 'Alí, son-in-law of Moḥammed, who is believed to descend nightly in an invisible shape, and perform his devotions.

Múshij is under the dominion of Sheikh Ḥusein bin Yahyá, whose character is so extraordinary, that it deserves to be more particularly noticed.

This chief owns the tract of land about three miles in length, by fifteen average breadth, extending from the back of Mokhá as far as Múshij, including the mountains bordering on Tehámeh. His influence with the neighbouring tribes of Bedawis is so great, that Moḥammed 'Alí, the Páshá of Egypt, is glad to purchase his alliance, or, more properly speaking, his neutrality, at the rate of eight or ten thousand dollars a-year. He is absolute in his own territory, and his commands are obeyed with the blindest devotion. His nominal residence is at the fortress of Heis, situated in a deep ravine eighteen miles N.E. of Múshij, but it is never certainly known where he is. He is held in such dread by the peasantry, that they scarcely mention his name but in a whisper, and he bears the highest character for impartial but strict justice. For several years his alliance has been courted by the Imám of Šan'á, who is naturally anxious to secure his co-

* Little Head.

† Also called Maushid, Niebuhr's Descr., p. 224.

operation in defending the country from an invasion of the Turks; but the sheikh persisted in remaining neuter, till the continued encroachments of the Governor of Mokhá roused him. He then at once renounced all friendship with Mohammed 'Alí, and, in company with Sídí Kásim, the exiled uncle of the Imám of Şan'á, invested the fortress of Ta'ez, where there were two regiments of Egyptian infantry, and which, as we understood, he succeeded in reducing.

The latest accounts we had, stated that he had furnished the exiled Sídí Kásim with troops; and that, in company with the tribes of Do Mohammed and Do Husein, whose territories lie in the neighbourhood of Dhamár and Ebb, Sídí Kásim had dethroned 'Alí ben 'Abd-allah el Mansúr, the reigning Imám, and established himself at the head of the government. Thermometer in shade at 1 P.M., 95° Fahr.

July 15.—Our next stage, of eight hours in a north north-east direction, to the hamlet of Sherjah, was of little interest, the country being nothing but an arid sandy plain, covered with a coarse kind of grass and stunted bushes, here and there intersected by the dry bed of a mountain-torrent. Thermometer in shade at 1 P.M., 95°.

July 16.—From Sherjah to Zebíd, six hours and a half, in the same direction, the country presented a better appearance, being in many places carefully cultivated. This valley is mentioned by Niebuhr as the "largest and most fruitful in the whole of Tehámeh;" and in a prosperous season it certainly would deserve that appellation. Four years of continued drought had, however, completely burned up the soil, and the husbandman could not but despond when he had placed the grain in the ground, and saw no prospects of a return for his labour.

Wádí Zebíd is in many places covered with a thick brushwood of tamarisk, which affords shelter to numerous wild guinea-fowl. We shot several, and found them quite as palatable as the domestic birds bred in England.

We did not reach Zebíd till midnight; and, the gates of the city being closed, we were obliged to search for accommodations in the suburbs, which, after some difficulty, we found.

Zebíd is a city of moderate size, not quite so large as Mokhá. It had a peculiarly gloomy appearance, owing to the dark colour of the bricks with which the houses are built, and the ruinous state of many of them. It is, I believe, considered as being the most ancient town in Tehámeh. The Arabs have a tradition that it has been three times washed away by floods, with the exception of the Mesjid el Jámí, or principal mosque, which certainly wears a venerable appearance.

That edifice is very large, and has an octagonal menàreh, which is ornamented with a light net-work of stone, giving it a very elegant appearance. The interior is the same as in other mosques, and consists of one large room, with the kiblah pointing out the direction of Mekkah, and several small adjoining oratories branching off in different directions, containing the tombs of deceased "wells," or saints. The "súk," or market, is remarkably well arranged, and divided into three compartments for fish, flesh, and vegetables. The supplies are ample for the garrison of 700 men, and the inhabitants, who may amount to 7000 persons.

With the exception of a few rusty 24-lb. carronades at the principal gate Zebid is destitute of artillery. Like many other Arab towns, the number of tombs and mosques outside the walls render it practicable to march an invading force within 100 yards of the town without the slightest exposure. So long as the Arabs have no artillery the Egyptian troops are safe in Zebid. In that case the town is well adapted for defence, the walls being high and crowned with numerous towers with loopholes for musketry. The town is well supplied with water; indeed, on our return, we found the road impassable from the overflowing of a mountain-torrent.

In many parts of Arabia, and particularly in Socotra, the marks of very heavy mountain-torrents are evident, but with one exception I never witnessed the effects of one at the time; this was on our return from Šan'á, when, crossing a broad mountain-stream, a sudden rush of water took place that carried a donkey on which I was mounted off his legs, and drowned him before we could succeed in catching him, nor did I land without much difficulty; ten minutes afterwards the stream was impassable, and the remainder of our party that had not crossed it were compelled to wait patiently till it had subsided. This must account for the numerous rivers that we see marked in old maps of Arabia; and in no place would a person be so easily deceived regarding their permanency as in Tehámeh, where the water always takes its old bed, and where the ravines are always clothed with thick under-wood.

I have, in the small map, traced the river at Zebid as it appeared on our return, but it must not be supposed that it is thus throughout the year. Four years, as I before stated, had elapsed without a drop of rain, and many persons may have been to Zebid in the interim and found everything dried up, as we did on our first arrival. With the exception of that of Zebid, all the streams I have laid down are perennial, generally of small size, but the best proof we have of their duration is the fact of their having many fish. Therm. in shade at 1 P.M. 96°.

July 17.—We left Zebid in the afternoon, and after a very

long and fatiguing stage of nine hours and a half, or nearly thirty miles, in a north-easterly direction, we reached the city of Beït el Fakîh,* an hour after midnight. The country we had passed over was, if anything, more arid and barren than any we had hitherto seen, and we heard with much satisfaction the assurances of our guides that this was our last stage in the plains of Tehámeh, and that the following night would see us, "In shá állah!" (please God), across the Turkish frontier and in the dominions of the Imám of Şan'á.

We found Beït el Fakîh a large town of 8000 persons, with a citadel of some strength in the centre of it. The town itself was unwallèd, and consisted generally of a large kind of house, built partly of brick and partly of mud, and roofed with branches of the date-tree. It is the frontier-town of the Egyptian government, and as such is of some importance, it being the emporium for all the coffee that comes from the interior. The principal articles of trade in Zebîd and Beït el Fakîh are piece-goods from India, consisting chiefly of coarse blue and white cloth, English shawls, which are in great request, spices from Java, and sugar from Mauritius, which are bartered for money, wax, gums, and frankincense, and a small quantity of coffee that the neighbouring Bedawís bring down in preference to sending it to the Şan'á market. Indian Barmans are the principal merchants in the place; they are very numerous, but they have to pay a very heavy tax to the governor, and one of them declared, with tears in his eyes, that they could not make near so much profit as in India under the government of the English. A heavy duty is here levied upon all káfilahs (caravans) of coffee that arrive from Şan'á on their way to Hodeidah, or Mokhá, and so vexatious are the continual demands upon the Şan'á merchants that it will end, in all probability, in their carrying their coffee to 'Aden, more especially as it is now under the English flag. The distance is nearly the same, and we frequently heard while in Şan'á that the merchants contemplated changing the route, if practicable; though of course, when this was said, they knew nothing of the treaty since formed by the Bombay government with the Sultán of 'Aden.

Beït el Fakîh is, without exception, the hottest town we found in Tehámeh, the thermometer being at noon 102° in the shade and 141° in the sun. The land between the city and the sea is higher than that on which the town stands, which prevents the sea breeze from cooling the air. In fact, we found the wind so heated in its passage across the dry sandy plain that lies between Hodeidah and Beït el Fakîh, that it was less oppressive when it was calm. The fort is governed by a bimbáshí,† or sub-captain,

* Lawyer's house,

† Bîng-báshí: i. e., head of 1000; a Turkish title.

and the garrison consists of about 500 men. The governor was extremely civil, but evidently thought we were going to the court of the Imám, to set on foot a treaty regarding the expulsion of the Turks from Yemen. He pointed out to us the numberless dangers of the road, and strongly advised us not to go; finding, however, his remonstrances of no avail, he no longer endeavoured to make us relinquish the attempt, and allowed us to depart with a good grace.

July 18.—We left the city at 6 P.M. and travelled in a north-east direction for eight hours immediately towards the mountains, the base of which we had for the last two days been skirting. After an alarm of robbers, on passing through some thick under-wood at the foot of the hills, which made us alight and prepare for an attack, but which proved groundless, we reached a pass, and, crossing over a low shoulder of the mountain, descended, by a densely-wooded ravine, into the beautiful valley of Senníf.* Dark as it was, it was evident that the scene was changed. Tall, majestic elm-trees, mingled with the wide-spreading tamarind, and forming a natural avenue, met our view. The bubbling of a brook was heard, and the sound of our footsteps was lost in the grass. To us, who for six days had been travelling in a comparative desert, the change was delightful in the extreme.

July 19.—At 1 A.M. we reached the village of Senníf, and were soon established in a comfortable serái, or meháyé, with a temperature comparatively so much lower that we were glad to sleep under cover. The village was very full, owing to its being the day of the “súk,” or market, and we in consequence could not procure beds till an hour before daylight, when we retired to rest much fatigued.

On rising in the forenoon we found Senníf a large village, built entirely of conical straw huts, with the exception of the sheikh's house, which was a large barn-like building. Its population may be 1000 persons. The sheikh sent us a fat sheep as a present, and offered us every assistance in his power. We found not only the appearance of the country but the dress of the natives totally altered; the men wearing conical straw hats and the women wide blue cotton trousers drawn tight round the ankle, their head-dress consisting of a handkerchief profusely ornamented with steel chains; they were also fairer than the peasantry of Tehámeh, owing probably to the greater coolness of the atmosphere in the mountains. In Socotra we found the Bedawís of Jebel Hajjýeh much fairer than the town-Arabs, and attributed it to the same cause.

The valley of Senníf has the shape of a horse-shoe, and is as carefully cultivated as the lands of India; wheat, jowári (Sorghum

* This cannot be the Sennef of Niebuhr, Voy. i. 334.

vulgare), and barley, flourished in great luxuriance, with several small patches of Indian corn, and some indigo.

Senníf is a market-town, and is also called "Súk el Jum'ah," or Friday-Market. There are seven market-towns between this place and Šan'á, in each of which the market is held on a different day of the week, and they are a night's journey distant from each other. The sheikhs of the different villages levy a tax upon all merchandise, and take the merchants under their protection for the time.

We here first saw the Bedawís of the mountains; they are very slightly but elegantly formed, and their average height is five feet six inches; their colour is lighter than that of the Bedawís on the southern coast, and they have long, black, curling hair. The dress of the higher classes among them consists of a blue frock or shirt, with very wide sleeves, bound tight round the waist by the belt of their yambé' or dagger, and no sash, or, as it is termed in India, "kamar-band." The dagger is different from any other that I have seen, being much longer and nearly straight. Their turban is of blue cloth, with several folds of cotton of the same colour bound round it, the Bedawí disdaining to wear the straw hat used by the cultivators of the soil. They carry a short sword with a very broad, spoon-shaped point, if I may use the term, and a long matchlock. When on horseback they carry a very long spear, having a tuft of horse-hair close to the steel head. They appear to be very quick in taking offence, but their quarrels seldom last long. I have seen a man deliberately draw his sword and endeavour to cut down another with whom he was disputing, nothing but the folds of his turban saving his life, and I have been surprised to see the very same men quietly smoking their pipes together on the evening after the quarrel. We found them inquisitive, but not impertinently so. They would collect round us when we halted and listen to our accounts of "Wiláyah,"* or England, or to what they infinitely preferred, the musical box which we had with us. Some, indeed, after hearing the box for a minute or two, would exclaim, "'Audhá Billah min Sheítán e rajím!"†—"God preserve us from the power of the devil!"—and walk away, but they were generally laughed at for their folly. They all expressed the utmost detestation of the Turks, or "El Ahmarán" (the red men), as they designated them, and laughed at the idea of their endeavouring to penetrate into the interior through the intricate mountain-passes.

Our party was here increased by the addition of the leader of a large káfilah, which was awaiting us about twenty miles further

* The (foreign) country; hence Wiláyatf, corrupted by the Bengalese into Biláitf.

† "'Audhán billahi min Sheítán er rajím," lit. (I fly) for refuge to God from Satan the stoned.

on, and two Šan'á merchants, mounted on two very beautiful Abyssinian mules. Therm. in shade at 1 P.M. 88°.

July 20.—As the intricacy of the passes would not admit of our journeying by night, we left Sennif at daylight and proceeded through a very romantic valley called Wádí Koleibah, on our way to Hajír, which was to be our halting-place for the night.

As we gradually ascended, the scenery hourly became more striking and magnificent. The hills were thickly clothed with wood, and we recognised several trees that we had formerly seen in the Jebel Hajjiyeh of Socotra. The villages became more numerous, and, the sides of the mountains being in their natural state too steep to admit of grain being cultivated, they are cut away so as to form terraces, which in many places gives them the appearance of an immense amphitheatre. The hamlets are generally built of loose stones with flat mud roofs, and, perched upon overhanging rocks as they generally are, they add considerably to the romantic beauty of the scene. After a halt of an hour during the hottest part of the day at one of these villages called Abú Kírsh, as its latitude, we again pursued our way up a steep ravine where we had to dismount. We here observed many large trees, one in particular, of a spongy nature, the stem about two feet six inches in diameter, and the leaves very large and of a leathery texture. It is called by the natives the "Tolak-tree," (Ficus Bengalensis), and is generally covered with the nests of the "baia,"* a small kind of sparrow. I have seen upwards of 300 nests upon one tree. They are of a pear shape, having a long funnel-like aperture at the base, and the interior divided into two compartments, one for the male and the other for the female and her progeny.

Partridges (the red-legged species) and Guinea-fowl are plentiful, though wild, and we also observed the jungle-cock of India.

A very fatiguing ascent of three hours brought us to a large fortified seráí, or, to use the mountain term, "simsərah," on the ridge of a mountain, and commanding the pass on both sides, and this we found was our halting-place for the night. The simsərah† of Hajír was a large square building about forty feet high. Round the interior were two stories of cells, and the central space was appropriated to the beasts of burden. We found the temperature here 79°, which, to us, who had not forgotten the heat of Beít el Fakíh, was very low, and we were

* Baīah?

† Not found in this sense in the dictionaries, but Simsár, "a broker," or "valuer;" one who assists strangers in making bargains, gives a clue to the meaning of samsareh or simsereh, "the place of brokerage."

glad to creep into our cells, though we soon discovered that we were not the sole occupants of them.

On another ridge immediately above Hajír is a fortress of considerable strength belonging to the Bení Dhobéibí* tribe, though nominally one of the frontier garrisons of the Imám. We found, however, that of late years his authority has been much curtailed, and the Bedawí tribes now levy an arbitrary tax upon all káfilahs of merchandise, whether going or returning, that pass through their territories, in return for which they furnish them with a guard. We here found a large káfilah of goods from Hodeidah, bound to San'á, and an escort of about thirty men from the fortress to attend them, accompanied by Sheikh Ghází Nají in person. We joined their party, and whether they did not think it worth while to demand a tax from us, or whether they were in fear of the Imám, we knew not; they received us civilly, and said we were welcome to join them. Hajír is about 1200 feet above the sea.

July 21.—We started at sunrise, and, descending the ravine on the east-north-east side of Hajír, pursued our way through a broad and well-cultivated valley, gradually increasing in width as we approached Husún† Dikarah or Dakrah, a very strong hill-fort on a conical-shaped mountain, belonging to the same tribe. The valley called Wadí Seihán here opened out into a broad plain, increasing in size till it was lost in Tehámeh, some miles to the northward of the parallel of Hodeidah.

The mountains on the north side of this plain are known as Jebel Harráz, and on the other side they are called Jebel Burra'. On both these mountains are coffee-plantations, but those on Jebel Burra' are small and insignificant, while Jebel Harráz produces very superior coffee. It is likewise celebrated for the variety and abundance of its fruit.

In many places in the vicinity of our road we found large enclosures of several kinds of grain, but were cautioned not to straggle from the main body of the party, as a small tribe called the Bení Khórah, who reside in the ravines bordering on Jebel Harráz, were in the habit of waylaying any unfortunate straggler, and, contrary to the usual custom of Arab banditti, murdering their captives. A party had been seen in the valley that morning, and our escort accordingly received an additional reinforcement from Husún Dakrah. This dreaded part of the plain is known as 'Khubi ibn Deran,‡ and we were shown several graves which

* Probably the Bení Doleibí.—Niebuhr, *Descr.* p. 248.

† Husún, the plural, is commonly used by the Arabs for the singular, Hign.

‡ Probably the Khobt Derham (Drachm-plain) of Niebuhr,—*Descr.* 149.

remained as monuments of the cruelty and ferocity of these miscreants.

We now crossed over an undulating country for several miles, much more barren than that we had left; and, shortly after fording a broad stream that runs down Wádí Šeihán, we reached the village of Samfúr at noon.

We here found another large káfilah from Šan'á bound to Mokhá with coffee, and, therefore, our guards left us to take back this party, and made us over to the charge of Sheikh el Jeradí, who was to see us safe as far as Mofhak, or two days' journey towards Šan'á. The village of Samfúr may contain about 20 houses or huts. Therm. 82° in shade.

July 22.—On leaving Samfúr the next morning, we found several people by the road-side with baskets of fruit from Harráz, amongst which we saw the peach and apricot, several kinds of grapes, walnuts, and a small species of pear, like the stone-pear of England.

The Harráz mountains are at least 1500 feet high from the plain on which they stand, and by our estimate about 3000 above the level of the sea. They are apparently composed of a species of trap-rock. They afford a residence to many tribes of Arabs, who are nominally under the dominion of the Imám, but, like all the other tribes, pay no tribute beyond the tax which is levied upon their coffee as it passes through the gates of Šan'á. The coffee of Harráz is very superior, but not of the best kind, the trees from 'Uddein, the "'Uddeini," being much larger than the others, and about twelve feet high.

The valley now became much narrower, in many places not exceeding twenty yards in width, while the mountains on either side rose to the height of 1200 or 1400 feet above the plain, thickly wooded to within 200 feet of their summit, where they presented a barren sheet of grey limestone rock. Under a huge mass which had fallen and completely blocked up the valley, we found a coffee-house and two or three small huts. Understanding that there was a coffee-plantation in the neighbourhood, and of the very best quality, we gladly availed ourselves of the suggestion of Sheikh el Jeradí, and halted there for the day. A scrambling walk over the before-mentioned rock, by means of steps cut in it, brought us to the coffee-plantation of Dórah.* It was small, perhaps not covering half an acre, with an embankment of stone round it to prevent the soil from being washed away.

The coffee-plant is usually found growing on the side of any

* Coffee-plantation Eddóra. Niebuhr, Reise, i. 433.

valley or other sheltered situation, the soil which has been gradually washed down from the surrounding heights being that which forms its support. This is afforded by the decomposition of a kind of clay-stone, slightly porphyritic, which is found irregularly disposed in company with a kind of trap-rock, among which, as we approached Şan'á, basalt is found to predominate. The clay-stone is only found in the more elevated districts, but the detritus finds a ready way into the lower tract by the numerous and steep gorges that are visible in various directions.

As it is thrown up on one side of the valley, it is there carefully protected by stone walls, so as to present the appearance of terraces.* The plant requires a moist soil, though I believe much rain is not desirable. It is always found growing in the greatest luxuriance when there is a spring in its vicinity; for in those plantations where water is scarce the plant looks dry and withered. The bean is gathered twice a-year, and we were told that one of the Dórah trees, though of the smallest quality, ought to produce in the two crops at least ten pounds, or a Şan'á "maund."†

We found the fig, plantain, orange, citron, and a little indigo, growing among the coffee. A stream of water from a neighbouring spring was drawn through the garden, and we were told that the roots of each plant were regularly watered every morning and evening. The plant is said to live six years; three of which are requisite for bringing the tree to perfection, for three it bears, and then dies and is rooted up. Therm. in shade 75°.

July 23.—The following morning, accompanied by the sheikh and his party, we left Dórah and took the road to Mofhak,‡ travelling for nine hours in an east half north direction. The country was more open and highly cultivated. Barley seemed to be the principal grain, though there were many enclosures of Indian corn and wheat. In this stage particularly, we observed many of the trees found in Socotra. I had (when Captain Haines of the *Palinurus* was employed in surveying that island) accompanied Lieut. Wellsted, and was on the island for nearly two months; a great part of which time was spent among the rocky ranges of Jebel Hajjiyeh. At that time, Dr. Hulton, my present companion, was of opinion that they were peculiar to the island, but I have since seen them on the mountains at the back of

* See Niebuhr, Voy. I. Pl. lxiii, lxx.

† Man, pronounced maun by the Bengalese, whence the English "maund," an Indian measure introduced by merchants, as kīrsh, in the plural kūrúsh, from the Turkish ghurúsh, is derived from the German grosch, and used as the name of the piastre.

‡ Niebuhr, Descr. p. 250, Voy.

Dhofár, and also on the hills of Yemen, especially the dragons'-blood-tree, and the lubán or frankincense-tree, which we at first thought was not to be found in Socotra, but, on comparing the sabhúr tree* of Socotra with a specimen of the lubán that I procured on the southern Arabian coast at Hàsek, they were found to be exactly the same.

The valley of Dórah, through which we travelled in an E.N.E. direction, opened, after three or four miles, upon a large plain, in the midst of which was the village of Šeihán.† The country was the same as that we had hitherto passed through, though not so mountainous. At three we reached the village of Mofhak, and found good quarters in a simsereh. This village of 50 huts is situate on the crest of an oblong hill, about 300 feet high, the sides of which are too steep for any beast of burden to ascend. It presents the appearance of an immense fort, and with a little care might be rendered impregnable. We here found another plantation of coffee of the 'Uddeini sort. The trees were about twelve feet in height; but, owing to a scarcity of water in the immediate neighbourhood, looked sickly and faded.

Our Arab guards here left us, as no further danger was to be apprehended. A piece of white cloth and a little gunpowder made the old sheikh quite happy, and we parted good friends. The lat. of Mofhak, deduced from a mer. alt. of the sun taken seven miles west of the village, is $15^{\circ} 8' N.$; therm. in shade 74° .

July 24.—On the following morning we made a short stage of four hours, in an E.N.E. direction, to the village of El Hudheín,‡ and here we sent on a courier to Šan'á with a letter to one of the principal merchants, which our Mokhá friend, Hájí 'Abd-er-Rasul, had kindly provided us with. Thermometer in shade, 73° ; temperature of a spring, 64° (Fahr.).

In the immediate vicinity of El Hudheín are several villages, and the inhabitants of these, hearing that two white men had arrived, crowded round us to beg we would tell them if any rain was coming. For some days the appearance of the weather had been threatening, and we therefore told them that rain would come, and they departed, quite satisfied that we knew all about it.

July 25.—At 6.30 started for Motteneh, distant eight hours and a half, in a general E.N.E. direction. At 3 m. we passed the village of Súk-el-Khamís; at 7 m. reached the village of Bowán, where we found a neat stone bridge thrown across the stream that flows to the Wadí Šeihán; at 13 m. passed Yazil, a hamlet of about 30 houses. On leaving El Hudheín we ascended gradually for about two hours, when we reached the ridge of the mountains; and from the summit a most magnificent view burst upon

* Subbár?

† Šehán, Niebuhr, Voy. i. 432.

‡ Hadein, Niebuhr, Voy. i. 431.

us. The hills formed an immense circle, like the crater of a huge volcano, and the sides of which, from the top to the bottom, were cut regularly into terraces. I counted upwards of 150 in uninterrupted succession; and the *tout-ensemble* was most extraordinary. At the bottom of this basin ran a small stream,* which, from the height at which we were, looked like a silver thread.

Small hamlets, each with its little white mosque, were scattered over the sides of the mountains, and added greatly to the beauty of the scene.

We skirted the edge of this natural amphitheatre, and shortly afterwards reached a long table-land, very barren and stony, that extended to the village of Motteneh.

We had now attained our extreme elevation, and I do not think we were less than 5000 feet above the level of the sea; and, as this was the last stage before we reached Šan'á, I will here introduce a few hasty notes made by Dr. Hulton before illness rendered him unequal to any exertion:—

“The hills in the neighbourhood of Senníf are not high, and seem to be composed of a species of trap-rock of various kinds. Hills of the same kind prevail as far as Samfúr, where the compound becomes more crystalline, and partakes of the character of granite. Here the hills assume a remarkably varied appearance. Stupendous masses are heaped one on the other to an immense height, and others have rolled down of such dimensions as almost to obstruct the road through the valley.

“Near Mořhak this rock disappears, and a mixed kind then prevailed, with a large proportion of hornblende, aluminous matter, and quartz.

“From El Hudheín the clay predominates; and from this bed it would seem that the chief part of the soil deposited in the valleys is washed down. After surmounting the lofty hills beyond Khamís,† the country is less mountainous, and appears to be more of a volcanic nature, large masses of cellular trap and scoríæ lying scattered on the plain.”

During our stay at Motteneh we had a most terrific storm of thunder, lightning, and rain. It lasted about three hours, and washed down many of the huts in the village. We were told that it was the *first rain that had fallen for three years!* and the event was celebrated by a kind of festival. Therm. in shade, at 8 P.M., 72°; at 2 A.M., 53°. Pop. of vill. 250 persons.

July 26.—On the following day we left Motteneh at seven A.M., and continued over a table-land, in a N.E. direction; at 10 h. we passed the village of Lalwá, and at noon reached that of

* The Wádí Šeihán, according to Niebuhr's map.

† Šúk-el-Khamís (Thursday market). Niebuhr, Voy. i. 431.

Assúr, seated at the eastern verge of this plateau, and saw the city and beautiful valley of Šan'á* stretched before us.

My first sensation was that of disappointment; but it soon gave way to a more pleasant feeling. We quickly descended about 1200 feet into the valley, and at three o'clock entered the suburbs of the city by the "Báb Ká'-el Yahúdí,"† or the Jews' Gate.

The first thing that struck us on entering the city was the width of the streets and their cleanliness. This, however, did not last long, as we became more acquainted with the town. The suburb of Bír el 'Azab, through which we were passing, is now walled round, although it was not so in Niebuhr's time. We saw no guns on the fortifications.

Proceeding through the Jewish town, we were met by Ismá'il Walání, our Šan'á friend, to whose care we were consigned. He received us very cordially, and conducted us to a very neat house in the Bír el 'Azab, where preparations had been made to receive us. We were now told that our sudden arrival had caused great uneasiness to the imám, as he imagined we were nothing more than Turkish spies. We hastened to convince Ismá'il of the error, and were shortly after waited upon by the vizier, Mohammed Sa'dí, who had a long conversation with us, and, having ascertained that we were British officers, welcomed us formally, in the imám's name, to Šan'á.

The etiquette of not allowing strangers to receive visits, which existed in Niebuhr's time, is still in force: we were therefore carefully locked up for the remainder of the day; but everything we could wish for was brought to us, and, with the exception of not being allowed to walk about the town, we did as we pleased. On the following day the vizier again called, and told us that the imám had provided another house for us in his own gardens, and accordingly we were conducted thither. Shortly after our arrival we were summoned to attend the Imám in his palace of Bustán el Metwokkil.‡

We found his highness in a large saloon, very splendidly furnished,§ sitting on a raised throne of richly-carved wood, with a silk canopy overhanging it. By his side stood his uncle Seyyid Moḥammed, or the Seif el Khalífah.|| The Imám wore a white turban, with a skull-cap of cloth of gold, a rich crimson silk robe reaching to his ankles, and a Kashmír shawl. His dagger, which was

* Capital of Yemen, or Arabia Felix.

† Báb-el-ká'el Yahúdí, i. e. Jews' Plain Gates. Yahúdí, also called 'Oseýr, was a separate town in Niebuhr's time. Descr. p. 232.

‡ Properly Mutewakkil. El Mutewakkil billah (he who trusts in God) is a title assumed by the Imáms of Šan'á.

§ Luxury seems to have crept in since Niebuhr's time. See Voy. i. pl. lix.

|| The khalif's sword.

quite a blaze of jewels, had a gold hilt and scabbard. He received us kindly, ordered two chairs to be brought in for us, and accepted the presents we had to offer him. He repeatedly asked if we were not French, and seemed pleased at our declaring ourselves to be English. Dr. Hulton prescribed for some imaginary pain that he complained of, and we were then told that our audience was at an end.

A present of five sheep, some wax candles, and a bale of Persian tobacco, followed us; and we were besieged on all sides for a "Bakhshish," or present of money, by the eunuchs who brought them. We were permitted to walk through the gardens, where we found many English fruits in great luxuriance; but there had been a great scarcity of rain here, as well as on the mountains, and everything looked dry and withered.

A large fountain played in front of our house, overshadowed by a huge vine that almost broke under its load of fruit. Walnuts, figs, and plums were plentiful; and the trees were the resort of a great number of black monkeys, which I suppose had been settled there for the Imám's amusement. We went out in the evening; and, though the people crowded about us in great numbers, no insult was offered, and we were allowed to do as we pleased. As, however, a daily journal of our movements here would be tedious, I will endeavour to describe the city and the court of the Imám as we found them in 1836. In Şan'á we adopted the English costume, as it was already known there, and, having proclaimed ourselves English officers, we thought it best to appear in our uniform.

The Imám of Şan'á has two large palaces with extensive gardens adjoining; the whole walled round and fortified. The first and largest is called Bustán el Sultán, or the Garden of the Sultán; the other, which is the most ancient, Bustán el Metwokkil.* They are built of hewn stone, plastered over with a grey-coloured mortar, having the windows and cornices of a bright white colour, which gives the house a very light and airy appearance. Fountains appear to be indispensable in the houses at Şan'á, and in the Bustán el Metwokkil there are several. The Imám has a stud of very fine horses that are always piqueted in front of the palace. They come from the desert of Jóf, to the north of Şan'á, and for the first four years of their life rarely taste anything but dates and milk. They are larger than the "Nejdi" breed, but I believe are not considered as inferior to them in symmetry or speed.

At daylight every morning the levee takes place, and by eleven

* Mr. Cruttenden has kindly presented drawings of these two palaces to the library of the Society. The architecture appears Saracenic; simple and elegant, though with a mixture of circular and pointed arches, and not loaded with superfluous ornaments.—Ed.

o'clock the Imám is no longer visible. 'Alí Mansúr, who was the reigning prince during our stay (though since deposed), was much addicted to drinking spirits, and in fact was rarely sober after mid-day. He was a young man, born of a Nubian mother, and with a peculiarly disagreeable expression of countenance, owing to a cast in his right eye. As a Zeidí in faith, the use of tobacco was forbidden to him; but it can hardly be supposed that a man who would disregard one precept of the Korán would hesitate to break another. His days were consumed in smoking and drinking with the lowest of his servants, who plundered him in all directions. We were twice invited to join him in his house during these hours of recreation, but were too much disgusted to repeat the visit.

On Friday the Imám goes in state to the mosque, and the procession we witnessed was very splendid. Troops were called into the town to assist at the ceremony, and during the time of the procession the city gates were, as usual, closed. About fifty armed Bedawís formed the commencement of the cavalcade. They walked six abreast, and sang in chorus. The principal people of the town followed, mounted on horseback, each carrying a long spear with a small pennon. The Imám next followed on a splendid white charger, and very superbly dressed. He held in his hand a long spear with a silver head, having the shaft gilt. His left hand rested on the shoulder of a confidential eunuch, and two grooms led his horse. A very magnificent canopy, much like an umbrella in form, was carried over his head, having the fringe ornamented with silver bells.

The Seif el Khalifah came next, having a canopy held over his head likewise, but smaller and less costly. The commander of the troops and the Imám's relations and principal officers followed, and about 100 more Bedawís closed the procession.

On reaching the square in front of the palace, the footmen ranged themselves round it, and the Imám, followed by his nearest relations, galloped repeatedly round the square, brandishing his spear, and making a feint of attacking the nearest horseman. After this had lasted some minutes, the imám stood still in the centre of the square, and the people rushed from every quarter to kiss his knees. He then retired towards the palace, and as he passed under the archway, a gun was fired to give notice that the ceremony was at an end.

The government of Şan'á under an Imám is, we were told, to be dated from the time that the Turks in the reign of Suleimán, commonly styled "the Magnificent," were driven from that part of the country about 210 years since. The greater part of the fortifications in the old city of Şan'á were built by them, and there are the remains of a noble aqueduct yet existing, said to be their work. The first Imám was Kásim Abú Mohammed, a "sherif" or de-

scendant of the Prophet, of the family of Imám Hádi—Abú Mohammed's son took the name of "Metwokkil Allah," God's Vicegerent*—and this is now common to all the Imáms, as well as that of "Mansúr,"† or Conqueror. The Arabs of Şan'á have a tradition that a descendant of the Imám shall assume the name of "El Hádi," the Regenerator,‡ and carry every thing before him, when, having taken the name of "El Mahadí," and converted all nations to the religion of "Eslam," the world will come to an end.

Sídí Kásim, uncle of the reigning Imám, who was banished during our stay, all his property having been confiscated, soon after our departure assumed the title of El Hádi, and so worked upon the superstitious fears of the Arabs, that he was enabled, through their assistance, to dethrone the Imám, and, under the name of "El Mahadí," assume the government himself.

The valley of Şan'á lies about 4000 feet above the sea; it is from 6 to 9 miles broad, extending northward as far as the eye can reach; it is bounded on the east by low table-land and a mountain called Jebel Nagam, rising about 1500 feet above the plain: to the west it is bounded by the table-land of Asúr and Lúlúwah, about 1200 feet in height; while to the south, at 7 miles' distance, it contracts into a narrow valley called Tarík el Yemen.

The population of Şan'á is great, perhaps 40,000, and I should say that in the four towns in the valley, viz., Şan'á, Ródah's Wadí Dhar, and Jeráf, there are not less than 70,000 people. The old city of Şan'á is walled round, and, including Bír el Azab, is 5½ miles in circuit: it has some guns, but in a very bad condition. The houses are large, and the windows of those of the higher classes are of beautiful stained glass. A handsome stone bridge is thrown across the principal street, as in wet weather a stream of water runs down it. The streets are narrow, though broader than those of Mokhá and Zebid. Great hospitality was shown us on entering their houses; we were always pressed to stay, and never allowed to go without taking a cup of coffee, or rather of an infusion of the coffee husk called "Keshr;" for, strange to say, though in the heart of the coffee country, coffee is never taken as a beverage, being considered as too heating. The infusion of the husk is very palatable; and we found it much more refreshing, and nearly as powerful a stimulant as the infusion of the bean itself.

The merchants form the principal body of men in the town. They are generally wealthy, and live in good style.

The Banians are also numerous, but they are compelled, like

* "The Truster in God."

† "The Guide, or Leader."

‡ "Aided by God;" thence "Victorious."

§ Raughah or Raughah i. e., Garden.

the Jews, to conceal what they really possess, and however wealthy they may be, to put on an outward show of abject poverty.

The principal trade is of course in coffee, but the Şan'á merchants are so fearful of trusting their goods to the Turkish government, that they prefer filling their warehouses with it in Şan'á to sending it to Mokhá.

The whole cost of transporting a camel-load of coffee from Şan'á to Mokhá is forty-four dollars, upon which the merchant clears a profit of three dollars and a half. It is brought into the Şan'á market in the months of December and January, from the surrounding districts. The nearest place to Şan'á where the coffee grows is Haffásh, about a short day's journey south-east of Şan'á. Attempts were made by the last Imám to cultivate the plant in his own garden, but without success, owing, it appears, to the cold. The varieties of coffee are "Sharjí" (the best), "Uddeini," "Maţarí," "Harrází," "Habbat," "Haímí," and "Shirází;" of these the Sharjí and Habbat are the smallest and best. *Qeshr* (husk), being more in demand at Şan'á, obtains a higher price. The best is the 'Anezí (Habbat), and is sold at twelve dollars for the hundred pounds; the inferior sorts at four, five, and six dollars for the same quantity. The imports are principally piece-goods and Persian tobacco, with dates from Tehámeh; and a great quantity of thread, or rather twist, for weaving. The import duties in Şan'á are very light, and indeed almost nominal. Glass is in great request, and the demand is supplied from Egypt. Very magnificent silks and velvets are exposed for sale in the bázár, as well as spices, sugar, &c. &c.

The principal artisans are the Jews; these amount to about 3000 persons, and live in a quarter of the city appropriated to them. As infidels, they are exposed to many exactions and repeated insults. Each man pays twenty-five *komásís* per month, or about a *dollar* per year, for permission to reside in the city. A sheikh is appointed, who is responsible for the regular payment of this impost, and of the heavy taxes that are likewise laid upon their vines, gardens, &c. They subsist chiefly by the sale of silver ornaments, gunpowder, spirituous liquors, and many by working as common artisans, such as shoemakers, &c. The mosques in Şan'á, about twenty in number, are very splendid, many of them having their domes gilt, particularly those containing the tombs of the Imáms. The baths are also very good, and on the same plan as those in Egypt: they are a favourite resort of the merchants, who meet here to discuss the state of trade and the news of the day, over their cup of *qeshr* and their never-failing *hukkah*. The Şan'ánís are very much addicted to chewing the leaf of a tree which they call "*kát*." It appears by their account to exhilarate and produce appetite; it also causes great thirst, and if taken in

large quantities, will bring on spasms. It is the never-failing accompaniment to the breakfast or dinner; and, from long use, appears to be indispensable. The wealthy merchants on weekdays generally ride a very fine-spirited kind of donkey, much larger than the English ass, and very strong and fleet. These donkeys are similar to those from Bahrein, in the Persian gulf. On Fridays, all who can afford it, appear on horseback to join the procession of the Imám to the Mesjid el Jámi'.

About five miles N.N.W. of San'á is the town of Ródah, which is much cleaner and neater than the capital, being the residence of nearly all the merchants, who retire to their country-houses after the business of the day is over. The gardens at Ródah and Wádí Dhár, another town five miles to the west of the former, are very fine, and the vineyards beautiful. The vines are trained over a trellisework about four feet from the ground, and are very extensive: the best kind of grapes are "el Bedá'," a small white grape without a stone, and the "'Ayún," a large black one very richly flavoured. Peaches, apricots, plums, &c., were abundant, and indeed formed the principal food of the lower classes. The town is well watered by several small streams: on the banks of one of these I saw the only gum Arabic tree which we had seen during the journey: there was an immense quantity of gum dropping from and incrusting on the bark, but it appeared to be considered as of no value by the town-Arabs. Half way between Ródah and San'á is the town of Jeráf, built much in the same style as the former places, and furnishing vegetables chiefly, for the San'á market. Each of these towns is governed by an Amír, who levies the government taxes in the name of the Imám.

The climate of San'á is too dry to be healthy: there is rarely any dew at night, and the wind produces a feverish feeling in the hands and face. In average seasons, rain falls three times a year, i. e., in January, in very small quantities, and frequently not at all; in June for about eight days: by this time the seed is sown and the cultivator looks forward to this season with great anxiety. Lastly, it falls in the latter end of July, when it is in the greatest abundance: a few farmers defer sowing till this period; but this is not commonly done when they can reasonably expect rain in June. In July the wind from the south-east prevails during the day, but, declining in force during the afternoon, it is met by a current of air from the north-west, and the two strata of clouds meeting in different states of electricity, thunder, lightning, and rain are the result. Thus it is that rain is never known in these regions at this period without being accompanied by vivid lightning and loud peals of thunder.

For nearly four years preceding our visit they had hardly had a drop of rain, which was the cause of incalculable distress to the

people in the vicinity. This long drought had added considerably to the general unhealthiness of the country. The people on our first arrival were dying at the rate of 150 per day, from the effects of a malignant fever which was raging with great violence, and which generally carried off the sufferer in four days. The famine was also dreadful here,* and dead bodies were seen in every corner of the streets awaiting the compassion of some one to afford them the means of burial. Many of the wealthy merchants fed a stated number daily, and boasted loudly of their charity. On inquiry, however, we found that the food furnished consisted merely of refuse grapes, such as were literally of no use. The Imám, too much engaged in his favourite amusements of smoking and drinking, thought little of the distress which his people were enduring; and though the incessant funeral chant, as the bodies passed under his windows on their way to the burying-ground, ought to have roused him from his gross sensuality, he heeded it not: the consequences fell heavy upon him. In a month from that time he was dethroned, insulted, and immured in a dungeon, while his uncle, who supplanted him, wisely endeavoured to secure the affections of the people by relieving their distresses with a liberal hand.

During our walks through the city we discovered the accompanying inscriptions,† and forthwith copied them on the spot. On close inquiry we found that the stones had been brought from Máreb, about two days' journey distant to the N.E.,‡ and that there were many more to be found there. The longest inscription was on a slab of white marble, and, when we saw it, served to cover a hole in the roof of a mosque. A bribe of a dollar had a magical

* To give an idea of the great scarcity experienced in 1836, and at the same time of the usual fertility of the soil in this part of Arabia Felix, I subjoin an account given to me by one of the principal Banian merchants in the town. Wheat, which in time of plenty is sold at 1s. 6d. the gaddá of 54lbs., was now selling at 3 dollars or 13s. 6d. the gaddá. Barley, usually sold at 6d., was now 8s. the gaddá. Jowárf, usually 9d., now 9s. the gaddá. Beans, usually at 8d., now 12s. the gaddá. Ghi, or clarified butter, usually sold at 4d., now 1s. per lb.

† That these inscriptions are specimens of the *Musnad* or ancient Himyarí character, will hardly be doubted by those who have read M. Rüdiger's learned paper in the *Zeitschrift für die Kunde des Morgenlandes* (Gött. 1837, 8vo., p. 332), though the corresponding alphabet given by him from an Arabic MS. may be fairly set down as one of the many literary frauds with which the half-learned in Asia have endeavoured to raise their reputation at the expense of truth; such, for example, are '*Ancient Alphabets*' and the late Mr. Price's interpretation of the *Persepolitan Inscriptions*, from a Persian MS. The striking resemblance, at first sight, between these Himyarí characters and those on the ancient Bactrian coins decyphered by Mr. Prinsep in the *Calcutta Asiatic Journal*, did not escape Mr. Cruttenden's notice; and it is possible that a further acquaintance with these characters will prove their identity: if so, the happy conjectures of Dr. Lepsius, in his tract on *Indian palæography*, will receive an extraordinary and unexpected confirmation.—F. S.

Professor Gesenius, to whom all our inscriptions have been sent, has, we understand, decyphered the words, "King of the Himyarites."

‡ Between seventy and eighty miles, according to Niebuhr's calculation.

effect on the scruples of a servant, and the stone was brought to our lodgings that night to be copied, and carefully replaced before daylight. The Jewish workers in gold assured us that frequently square gold coins were brought to Şan'á by the shepherds of Máreb for sale, and a Banian merchant corroborated this account, adding also that jewels, particularly pearls, are found there usually, after heavy rains, when the people closely search the water-courses, and generally find something to repay them for their trouble. In the Imám's garden I one day found a marble head, and on inquiry learned that this also came from Máreb: to my great mortification I was told that the figure arrived at Şan'á perfect, but was immediately broken by order of the Imám, as a relic of ancient idolatry, and I was unable to find the other parts of the statue: the head, however, I secured, after some demur on the part of the gardener, and brought it to England; it is the only specimen of sculpture that I have ever observed in Arabia Felix, and as such I esteemed it a curiosity.

Hearing so much about Máreb we forthwith determined to go there, and for that purpose sent for a sheikh who lived in that part of the country. The Imám, however, now became jealous of our proceedings, and for six days we were not allowed to leave our house in the garden. Our agent Ismá'il also gave us strong hints that we had better go at once, as the people in Şan'á were becoming troublesome, and the imám attributed it to the "Christians." At this time the uncle of the Imám, Sidí Kásim got timely warning that his head was in danger, and escaped that night, accompanied by about forty of the Imám's servants and guards, mounted on his best horses. We now found that we could do nothing: our garden-door was always locked, and what with disappointment and anxiety, my companion's health began to decline, and he soon was in a state that precluded all possibility of travelling.

After nearly three weeks of severe illness, Dr. Hulton thought himself strong enough to return to the vessel. As travelling on horseback was out of the question, I constructed a kind of palanquin out of an old litter belonging to the Imám, and procured twelve men to carry it.

I also went to take leave of the Imám, who sent us two fine horses and some shawls, as a parting present. On the 20th of August therefore we left Şan'á, having been resident in the town nearly a month.

The thermometer during our stay reached 75° as the highest and 55° as its lowest point, between the 26th of July and the 20th of August.

The crowd collected in the streets on the occasion of our departure was immense, but so far from insulting us, many appeared

Sketch of
the Northern Route from
MOKHÁ TO ŠANÁ.

by
J.G.Hulton, M.D. and C.J.Cruttenden
Indian Navy
1836.

5 10 20 30 40
English Miles

Found at Šaná

15

R

Rás Mejámi

E

D

Found on a detached Stone at Šaná

14

On the side of a house in the Bazaar Šaná

Rás Behil

13

A b y s

to commiserate the emaciated appearance of Dr. Hulton. All our friends assembled to see us depart, and accompanied us to the gates of the city, when we bid them farewell, and pursued our way slowly to Mateneh. Our journey to the sea was of course slower than it had been upwards, but on our arrival at Sennif my friend Dr. Hulton was sufficiently strong to travel on the back of a donkey; and in fourteen days from our leaving Šan'á we reached the gates of Mokhá.

Nothing worth notice occurred during our way down, except the demand of a few dollars made by the Arabs as toll for the passage of the escort across the Wádí Šeihán, and the improved appearance of the country, owing to the great fall of rain that had taken place during our residence at Šan'á. We found the ship still anchored at Mokhá, and all our friends very uneasy at our protracted absence. I hoped that the return to the sea would restore Dr. Hulton's health, but it was too late, and he died very shortly after he reached the ship.

In closing this brief Memoir of our journey into Yemen, I can only regret that the task has not fallen into abler hands than mine: I am well aware that an account drawn up by a man of such general attainments, and especially in geology, as Dr. Hulton, would have been far more valuable and satisfactory.

XXII.—*On a New Construction of a Map of a portion of Western Africa, showing the possibility of the Rivers Yeú and Chadda being the Outlet of the Lake Chad.* By Captain W. ALLEN, Royal Navy. Read 25th June, 1838.

THE little knowledge we have gleaned with immense sacrifice, in the interior of Africa, appears still more scanty until brought together and combined; and the isolated relations of individual travellers sometimes contain facts apparently unimportant, and at first sight at variance with others; whereas a careful examination of all the data will frequently reconcile conflicting statements, and by bringing one traveller to the assistance of another, will enable us to throw considerable light on this interesting subject.

Among the desiderata there are two very important points, namely, the verification and connexion of the various geographical positions, and the still unsolved problem of the nature of the lake Chad, as to whether it be a *still water* or have an outlet. These I propose to make the subject of the following paper:—

In the examination of the longitudes of former travellers, it is unfortunate that there are but few data on which to work; and I am obliged to prove the errors of others, from the assumed correctness of my own positions. Having, however, generally been