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British association, 1890: Report to council

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of sheets so as to give large towns like Leeds, with their environs, on a single sheet. I think that in this you are rather ignoring the principle upon which, whether rightly or wrongly, the Ordnance Survey has always been conducted. The department is directed to make maps on certain scales, which were settled after many years of controversy, for State purposes. The construction of special maps for popular use was designedly left to private enterprise, and any attempt to compete with private firms in "catering for the public" has been discouraged. I may remind you that the guide-book maps, to which you allude, are all based on the Ordnance Survey, and could not have been produced and sold at such slight cost without it. The public thus, and in many other ways, indirectly derive benefit from the great national survey.

I only received the proof of your paper this morning, and have not time to write a paper in reply, but you may read this note to the meeting, or get the Secretary to do so after your paper has been read. I have sent a few specimens of recent maps to Sir Lambert Playfair for exhibition in Section E, and enclose a specimen of the Indexes we are now publishing, which is cheap and clear enough for any one of ordinary intelligence.—Believe me, yours truly,

C. W. WILSON.

BRITISH ASSOCIATION, 1890.

REPORT TO COUNCIL.

BY A. SILVA WHITE, F.R.S.E.,

Secretary, Royal Scottish Geographical Society.

THE British Association for the Advancement of Science, under the presidency of Sir Frederick Abel, held at Leeds, from the 3d to the 10th of September, its sixtieth annual meeting. The number of Members and Associates who were present fell below the average of former years; but, although some of the Section rooms attracted only small audiences, the more popular ones were fully and constantly attended. No very brilliant, original, or sensational papers were contributed; but the work in each Section was of an average value. The Association has been accustomed to hear, year by year, much the same speakers on the same subjects; and the Leeds meeting enjoyed no immunity from this infliction. But a comparatively new, and eminently satisfactory, departure from the ordinary routine was afforded by the discussions that were organised in some of the Section rooms. It is obvious that discussions on important scientific or popular subjects are more likely to attract attention, and to lead to useful results, than an infinite number of individual and distinct contributions. The Association might secure a new lease of life if the system of organised discussions were persisted in; whereas, at present, the greatest difficulty is found, under the existing conditions of literary reproduction, to secure original papers of merit. With fewer papers, carefully selected and giving rise to discussions, the Association might attract many specialists who at present prefer to patronise other platforms.

Some signs of reformation in the organisation of the Annual Meetings were apparent at Leeds. Thus, the long-vexed question of the "luncheon hour" was discussed by the Sectional Committees and the Council of the Association. The majority would seem to prefer the morning hours between ten and two o'clock for the meetings of the Sections; but in the Geographical Section at Leeds an adjournment for luncheon was made between one and two o'clock, and with satisfactory results. Uniformity of practice in this respect is, however, very desirable. The organisation of the Sectional Committees was another topic discussed. In order to reduce the committees to a reasonable size, it was proposed not to print the names of ordinary members, but only those of the chief office-bearers, in the Journals. Furthermore, it was deemed desirable that only specialists should be asked to give their services on the Sectional Committees. These and other measures of reform will, it is understood, be taken into consideration by the Council of the Association.

The invitation from the city of Edinburgh, for the Association to meet at Edinburgh in 1892, was formally renewed and most cordially received at Leeds. The deputation from the Town Council of Edinburgh consisted of Bailie Colston and Dr. Russell, and was supported by Professor Armstrong, in his private capacity, and by Dr. Haycraft, Dr. James Burgess, and myself. Next year the Association is to meet at Cardiff.

The Geographical Section is always a popular one. At Leeds the papers were few in number. The Joint Meeting between the Geographical and Economic Science Sections, to consider the subject of "The Lands of the Globe still available for European Settlement," was, undoubtedly, of distinct importance, and led to an interesting discussion. The subject was introduced in a very able paper by Mr. E. G. Ravenstein. The only other sensational meeting of the Geographical Section was on the occasion when Miss Dowie narrated her experiences in the Carpathian Mountains, during the course of an adventurous journey made this summer. The "African day" was a failure: the "discussion" followed the same lines and was directed by very much the same speakers as in former years.

The following were the office-bearers of Section E:—

SECTION E.—GEOGRAPHY.

President.—Lieutenant-Colonel Sir R. Lambert Playfair, K.C.M.G., F.R.G.S.

Vice-Presidents.—Sir Frederic J. Goldsmid, K.C.S.I., C.B.; Sir Erasmus Ommanney, C.B., F.R.S., F.R.A.S.; E. G. Ravenstein, F.R.G.S.

Secretaries.—A. Barker, M.A.; John Coles, F.R.A.S., F.R.G.S.; J. Scott Keltie (*Recorder*); A. Silva White, F.R.S.E., SEC.R.S.G.S.

Committee.—Theodore Bent, F.R.G.S.; Dr. W. G. Blackie, F.R.G.S.; Rt. Hon. Sir George F. Bowen, G.C.M.G., D.C.L., LL.D., F.R.G.S.; Professor Flower, C.B., F.R.S., LL.D.; Sir James Kitson, Bart.; Dr. H. J. Johnston-Lavis; Dr. Hugh Robert Mill, F.R.S.E.; Dr. J. S. Phené, LL.D., F.R.G.S.; Sir Rawson W. Rawson, K.C.M.G., C.B.; Eli Sowerbutts, F.R.G.S.; Rev. Canon H. B. Tristram, F.R.S.; Cope Whitehouse.

The following is a list of the Papers read in Section E:—

Papers read on Thursday, September 4.

1. President's Address.—The Physical and Historical Geography of the Mediterranean.
2. *Dr. H. R. Mill.*—The Vertical Relief of the Land.
3. *Dr. H. R. Mill.*—Geographical Teaching in Russia.
4. *Sir Frederic J. Goldsmid.*—Railway Routes from Europe to India.
5. *H. F. B. Lynch.*—New Trade Routes into Persia.

Papers read on Friday, September 5.

1. *Dr. Kerr Cross.*—Nyassaland.
2. *Dr. Freeman.*—Ashanti.
3. *E. A. Maund.*—Zambesia and Lobengula.
4. *J. Scott Keltie.*—The Commercial Geography of Africa.
5. *A. Silva White.*—The Political Partition of Africa.
6. *E. Wilkinson.*—The Kalahari.

Papers read on Monday, September 8th.

1. Joint Meeting with Section F to consider the subject of The Lands of the Globe still available for European Settlement. Introduced by *E. G. Ravenstein.*
2. *Theodore Bent.*—Explorations in Cilicia.
3. Report of Committee for the Exploration of Cilicia.
4. *J. W. Wells.*—The Physical Geography of Brazil in its bearings on the Industrial Development of the Country.
5. *M. Thunar.*—Explorations in Argentina, Peru, and Bolivia.

Papers read on Tuesday, September 9th.

1. *Miss Mené Muriel Dowie.*—Some Notes on a Journey in the Carpathians and Ruthenia.
2. *Henry T. Crook, C.E.*—The Present State of the Ordnance Survey and the Paramount Necessity for a thorough Revision.
3. *Cope Whitehouse* and *Dr. Schlichter.*—Some points in connection with Ptolemaic Geography and Ptolemaic Maps.
4. *C. Tondini de Quarenghi.*—The Actual State of the Question of the Initial Meridian for the Universal Hour.
5. *Coutts Trotter.*—Recent Explorations in New Guinea.
6. *W. Pilcher.*—Spanish Honduras.
7. *Dr. Tempest Anderson* and *Dr. Johnston-Lavis.*—A Visit to the Skaptar district of Iceland.

Sir Lambert Playfair's Presidential Address is of such exceptional value and interest that we venture to give it *in extenso* (Appendix A). The Report of the Joint Discussion on Settleable Lands (Appendix B) has been based on the account in *The Times* of 9th September. Abstracts of some of the papers have been given (Appendix C), while other papers will appear *in extenso* in the pages of our Magazine.

The Corresponding Societies' Committee of the British Association submitted, at the first of the two meetings of the Conference of Delegates, a long report, which recorded a certain amount of work accomplished up to 1889. I attended both of the Leeds meetings, at which progress was further reported; and I must confess that, contrary to expectation, I found that distinct progress had been made, not only in the organisation of the co-operative work of the Corresponding Societies, but also in that of their various Committees. The difficulty of starting such a complicated scheme appears to have been almost overcome; it remains now to be seen in how far the Delegates may be able to promote the objects in view.

Grants by the Association in aid of scientific inquiries, either by individuals or Committees, amounted this year to as much as £1330. In regard to these grants, the following items are interesting to us:—

Meteorological Observations on Ben Nevis, ...	£50
Photographs of Meteorological Phenomena, ...	5
Seasonal Variations of Temperature, ...	20
Erratic Boulders, ...	10
Photographs of Geological Interest, ...	10
Volcanic Phenomena of Vesuvius, ...	10
Underground Waters, ...	5
Disappearance of Native Plants, ...	5
Zoology of the Sandwich Islands, ...	100
Zoology and Botany of the West India Islands, ...	100
Nomad Tribes of Asia Minor and Northern Persia, ...	30
Action of Waves and Currents in Estuaries, ...	150
North-Western Tribes of Canada, ...	200
Habits of Natives of India, ...	10

Committees were also appointed to deal with the following, among other subjects not involving grants of money:—Meteoric dust, underground temperatures, solar radiation, erosion of sea-coasts, earth-tremors, migration of birds, teaching in science, etc.

Certain Resolutions from the Sectional Committees were referred to the Council to be further dealt with. They included the following:—"That the Council should consider whether grants should not be made for other than specific researches by specified individuals"; "That the Council should watch the operation of Acts relating to technical and scientific instruction"; "That greater facilities should be afforded to the public for the purchase of the Ordnance Survey maps"; "That it were desirable there should be a more full and expeditious publication of papers, with reports of discussions on them"; "That the Journal should be simplified by separating the programme from the record, and both from the list of officers"; "That it were desirable to fix the meetings two years in advance, and to bear in mind that the latter end of September is the most convenient time"; and "That it were desirable to provide an index to reports of committees."

APPENDIX A.

PRESIDENTIAL ADDRESS TO SECTION E.

BY LIEUTENANT-COLONEL SIR LAMBERT PLAYFAIR, K.C.M.G.,
H.M. Consul-General in Algeria,

ON

THE MEDITERRANEAN, PHYSICAL AND HISTORICAL.

WHEN the unexpected honour was proposed to me of presiding over your deliberations, I felt some embarrassment as to the subject of my address. Geography as a science, and the necessity of encouraging a more systematic study of it, had been treated in an exhaustive manner during previous meetings. The splendid discoveries of Stanley and the prolonged experiences of Emin have been amply illustrated by the personal narrative of the former. The progress of geography during the past year has been fully detailed in the annual address of the President of the Royal Geographical Society in June last; so that it would be a vain and presumptuous endeavour for me to compress these subjects into the limits of an opening address. Closely connected with them are the magnificent experiments for opening out Africa which are being made by our merchant princes, amongst whom the name of Sir William Mackinnon stands pre-eminent, and by our Missionary Societies of various Churches, all acting cordially in unison, and sinking, in the Dark Continent, the differences and heartburnings which divide Christianity at home; I have thought it better, however, not to discuss matters so closely connected with political questions which have not yet passed into the realm of history.

In my perplexity I applied for the advice of one of the most experienced geographers of our Society, whose reply brought comfort to my mind. He reminded me that it was generally the custom for Presidents of Sections to select subjects with which they were best acquainted, and added: "What more instructive and captivating subject could be wished than THE MEDITERRANEAN, PHYSICAL AND HISTORICAL?"

For nearly a quarter of a century I have held an official position in Algeria, and it has been my constant delight to make myself acquainted with the islands and shores of the Mediterranean, in the hope of being able to facilitate the travels of my countrymen in that beautiful part of the world.

I cannot pretend to throw much new light on the subject, and I have written so often about it already that what I have to say may strike you as a twice-told tale; nevertheless, if you will permit me to descend from the elevated platform occupied by more learned predecessors, I should like to speak to you in a familiar manner of this "Great Sea," as it is called in sacred Scripture, the *Mare Internum* of the ancients, "our sea" (*Mare nostrum*) of Pomponius Mela.

Its shores include about three million square miles of the richest country on the earth's surface, enjoying a climate where the extremes of temperature are unknown, and with every variety of scenery, but chiefly consisting of mountains and elevated plateaux. It is a well-defined region of many parts, all intimately connected with each other by their geographical character, their geological formation, their flora, fauna, and the physiognomy of the people who inhabit them. To this general statement there are two exceptions, namely, Palestine, which belongs

rather to the tropical countries lying to the east of it, and so may be dismissed from our subject, and the Sahara, which stretches to the south of the Atlantic region—or region of the Atlas—but approaches the sea at the Syrtis, and again to the eastward of the Cyrenaica, and in which Egypt is merely a long oasis on either side of the Nile.

The Mediterranean region is the emblem of fertility and the cradle of civilisation, while the Sahara—Egypt, of course, excepted—is the traditional panther's skin of sand, dotted here and there with oases, but always representing sterility and barbarism. The sea is in no sense, save a political one, the limit between them; it is a mere gulf, which, now bridged by steam, rather unites than separates the two shores. Civilisation never could have existed if this inland sea had not formed the junction between the three surrounding continents, rendering the coasts of each easily accessible whilst modifying the climate of its shores.

The Atlas range is a mere continuation of the south of Europe. It is a long strip of mountain land, about 200 miles broad, covered with splendid forests, fertile valleys, and in some places arid steppes, stretching eastward from the ocean to which it has given its name. The highest point is in Morocco, forming a pendant to the Sierra Nevada of Spain; thence it runs, gradually decreasing in height, through Algeria and Tunisia; it becomes interrupted in Tripoli, and it ends in the beautiful green hills of the Cyrenaica, which must not be confounded with the oases of the Sahara, but is an island detached from the eastern spurs of the Atlas, in the ocean of the desert.

In the eastern part the flora and fauna do not essentially differ from those of Italy; in the west they resemble those of Spain; one of the noblest of the Atlantic conifers, the *Abies pinsapo*, is found also in the Iberian peninsula and nowhere else in the world, and the valuable alfa grass or esparto (*Macrochloa tenacissima*), from which a great part of our paper is now made, forms one of the principal articles of export from Spain, Portugal, Morocco, Algeria, Tunisia, and Tripoli. On both sides of the sea the former plant is found on the highest and most inaccessible mountains, amongst snows which last during the greater part of the year, and the latter from the sea level to an altitude of 5000 feet, but in places where the heat and drought would kill any other plant, and in undulating land where water cannot lodge.

Of the three thousand plants found in Algeria by far the greater number are natives of Southern Europe, and less than a hundred are peculiar to the Sahara. The *macchie* or *maquis* of Algeria in no way differs from that of Corsica, Sardinia, and other places; it consists of lentisk, *arbutus*, myrtle, *cistus*, tree-heath, and other Mediterranean shrubs. If we take the commonest plant found on the southern shores of the Mediterranean, the dwarf palm (*Chamerops humilis*), we see at once how intimately connected is the whole Mediterranean region, with the exception of the localities I have before indicated. This palm still grows spontaneously in the south of Spain and in some parts of Provence, in Corsica, Sardinia and the Tuscan Archipelago, in Calabria and the Ionian Islands, on the continent of Greece, and in several of the islands in the Levant, and it has only disappeared from other countries as the land has been brought under regular cultivation. On the other hand, it occurs neither in Palestine, Egypt, nor in the Sahara.

The presence of European birds may not prove much, but there are mammalia, fish, reptiles, and insects common to both sides of the Mediterranean. Some of the larger animals, such as the lion, panther, jackal, etc., have disappeared before the march of civilisation in the one continent, but have lingered, owing to Mohammedan barbarism, in the other. There is abundant evidence of the former existence of these and of the other large mammals, which now characterise tropical

Africa, in France, Germany, and Greece; it is probable that they only migrated to their present habitat after the upheaval of the great sea which in Eocene times stretched from the Atlantic to the Indian Ocean, making Southern Africa an island continent like Australia. The original fauna of Africa, of which the lemur is the distinctive type, is still preserved in Madagascar, which then formed part of it.

The fish fauna is naturally the most conclusive evidence as to the true line of separation between Europe and Africa. We find the trout in the Atlantic region and in all the snow-fed rivers falling into the Mediterranean; in Spain, Italy, Dalmatia; it occurs in Mount Olympus, in rivers of Asia Minor, and even in the Lebanon, but nowhere in Palestine south of that range, in Egypt, or in the Sahara. This fresh-water salmonoid is not exactly the same in all these localities, but is subject to considerable variation, sometimes amounting to specific distinction. Nevertheless it is a European type found in the Atlas, and it is not till we advance into the Sahara, at Tuggurt, that we come to a purely African form in the *Chromides*, which have a wide geographical distribution, being found everywhere between that place, the Nile and Mozambique.

The presence of newts, tailed batrachians, in every country round the Mediterranean, except again in Palestine, Egypt, and the Sahara, is another example of the continuity of the Mediterranean fauna, even though the species are not the same throughout.

The Sahara is an immense zone of desert which commences on the shores of the Atlantic Ocean, between the Canaries and Cape de Verde, and traverses the whole of North Africa, Arabia, and Persia, as far as Central Asia. The Mediterranean portion of it may be said roughly to extend between the 15th and 30th degrees of north latitude.

This was popularly supposed to have been a vast inland sea in very recent times, but the theory was supported by geological facts wrongly interpreted. It has been abundantly proved by the researches of travellers and geologists that such a sea was neither the cause nor the origin of the Libyan Desert.

Rainless and sterile regions of this nature are not peculiar to North Africa, but occur in two belts which go round the world in either hemisphere, at about similar distances north and south of the equator. They correspond in locality to the great inland drainage areas from which no water can be discharged into the ocean, and which occupy about one-fifth of the total land surface of the globe.

The African Sahara is by no means a uniform plain, but forms several distinct basins containing a considerable extent of what may almost be called mountain land. The Hogar mountains in the centre of the Sahara are 7000 feet high, and are covered during three months with snow. The general average may be taken at 1500 feet. The physical character of the region is very varied; in some places, such as at Toout, Moghrar, Touat, and other oases in or bordering on Morocco, there are well-watered valleys, with fine scenery and almost European vegetation, where the fruits of the north flourish side by side with the palm-tree. In others there are rivers like the Oued Guir, an affluent of the Niger, which the French soldiers, who saw it in 1870, compared to the Loire. Again, as in the bed of the Oued Rir, there is a subterranean river, which gives a sufficient supply of water to make a chain of rich and well-peopled oases equal in fertility to some of the finest portions of Algeria. The greater part of the Sahara, however, is hard and undulating, cut up by dry watercourses, such as the Igharghar, which descends to the Chott Melrihr, and almost entirely without animal or vegetable life.

About one-sixth of its extent consists of dunes of moving sand, a vast accumulation of detritus washed down from more northern and southern regions—perhaps

during the glacial epoch—but with no indication of marine formation. These are difficult and even dangerous to traverse, but they are not entirely destitute of vegetation. Water is found at rare but well-known intervals, and there is an abundance of salsolaceous plants which serve as food for the camel. This sand is largely produced by wind action on the underlying rocks, and is not sterile in itself; it is only the want of water which makes it so. Wherever water does exist, or artesian wells are sunk, oases of great fertility never fail to follow.

Some parts of the Sahara are below the level of the sea, and here are formed what are called *chotts* or *sebkhas*, open depressions without any outlets, inundated by torrents from the southern slopes of the Atlas in winter and covered with a saline efflorescence in summer. This salt by no means proves the former existence of an inland sea; it is produced by the concentration of the natural salts, which exist in every variety of soil, washed down by winter rains, with which the unevaporated residue of water becomes saturated.

Sometimes the drainage, instead of flooding open spaces and forming *chotts*, finds its way through the permeable sand till it meets impermeable strata below it, thus forming vast subterranean reservoirs where the artesian sound daily works as great miracles as did Moses' rod of yore at Meribah. I have seen a column of water thrown up into the air equal to 1300 cubic mètres per diem; a quantity sufficient to redeem 1800 acres of land from sterility and to irrigate 60,000 palm-trees. This seems to be the true solution of the problem of an inland sea; a sea of verdure and fertility caused by the multiplication of artesian wells, which never fail to bring riches and prosperity in their train.

The climate of the Sahara is quite different from that of what I have called the Mediterranean region, where periodical rains divide the year into two seasons. Here, in many places, years elapse without a single shower; there is no refreshing dew at night, and the winds are robbed of their moisture by the immense continental extents over which they blow. There can be no doubt that it is to these meteorological, and not to geological, causes that the Sahara owes its existence.

Réclus divides the Mediterranean into two basins, which, in memory of their history, he calls the Phœnician and the Carthaginian, or the Greek and Roman seas, more generally known to us as the Eastern and Western Basins, separated by the island of Sicily.

If we examine the submarine map of the Mediterranean, we see that it must at one time have consisted of two enclosed or inland basins, like the Dead Sea. The western one is separated from the Atlantic by the Straits of Gibraltar, a shallow ridge, the deepest part of which is at its eastern extremity, averaging about 300 fathoms; while on the west, bounded by a line from Cape Spartel to Trafalgar, it varies from 50 to 200 fathoms. Fifty miles to the west of the Straits the bottom suddenly sinks down to the depths of the Atlantic, while to the east it descends to the general level of the Mediterranean, from one to two thousand fathoms.

The Western is separated from the Eastern Basin by the isthmus which extends between Cape Bon, in Tunisia, and Sicily, known as the "Adventure Bank," on which there is not more than from 30 to 250 fathoms. The depth between Italy and Sicily is insignificant, and Malta is a continuation of the latter, being only separated from it by a shallow patch of from 50 to 100 fathoms; while to the east and west of this bank the depth of the sea is very great. These shallows cut off the two basins from all but superficial communication.

The configuration of the bottom shows that the whole of this strait was at one time continuous land, affording free communication for land animals between

Africa and Europe. The palæontological evidence of this is quite conclusive. In the caves and fissures of Malta, amongst river detritus, are found three species of fossil elephants, a hippopotamus, a gigantic dormouse, and other animals which could never have lived in so small an island. In Sicily, remains of the existing elephant have been found, as well as the *Elephas antiquus* and two species of hippopotamus, while nearly all these and many other animals of African type have been found in the Pliocene deposits and caverns of the Atlantic region.

The rapidity with which such a transformation might have occurred can be judged by the well-known instance of Graham's Shoal, between Sicily and the island of Pantellaria; this, owing to volcanic agency, actually rose above the water in 1832, and for a few weeks had an area of 3240 feet in circumference and a height of 107 feet.

The submersion of this isthmus no doubt occurred when the waters of the Atlantic were introduced through the Straits of Gibraltar. The rainfall over the entire area of the Mediterranean is certainly not more than 30 inches, while the evaporation is at least twice as great; therefore, were the Straits to be once more closed, and were there no other agency for making good this deficiency, the level of the Mediterranean would sink again till its basin became restricted to an area no larger than might be necessary to equalise the amount of evaporation and precipitation. Thus not only would the strait between Sicily and Africa be again laid dry, but the Adriatic and Ægean Seas also, and a great part of the Western Basin.

The entire area of the Mediterranean and Black Seas has been estimated at upwards of a million square miles, and the volume of the rivers which are discharged into them at 226 cubic miles. All this and much more is evaporated annually. There are two constant currents passing through the Straits of Gibraltar, superimposed on each other; the upper and most copious one flows in from the Atlantic at the rate of nearly three miles an hour, or 140,000 cubic metres per second, and supplies the difference between the rainfall and evaporation, while the under-current of warmer water, which has undergone concentration by evaporation, is continually flowing out at about half the above rate of movement, getting rid of the excess of salinity; even thus, however, leaving the Mediterranean saltier than any other part of the ocean except the Red Sea.

A similar phenomenon occurs at the eastern end, where the fresher water of the Black Sea flows as a surface current through the Dardanelles, and the saltier water of the Mediterranean pours in below it.

The general temperature of the Mediterranean, from a depth of 50 fathoms down to the bottom, is almost constantly 56° Fahr., whatever may be its surface elevation. This is a great contrast to that of the Atlantic, which at a similar depth is at least 3° colder, and at 1000 fathoms sinks to 40°.

This fact was of the greatest utility to Dr. Carpenter in connection with his investigations regarding currents through the Straits, enabling him to distinguish with precision between Atlantic and Mediterranean water.

For all practical purposes the Mediterranean may be accepted as being, what it is popularly supposed to be, a tideless sea, but it is not so in reality. In many places there is a distinct rise and fall, though this is more frequently due to winds and currents than to lunar attraction. At Venice there is a rise of from one to two feet in spring tides, according to the prevalence of winds up or down the Adriatic, but in that sea itself the tides are so weak that they can hardly be recognised, except during the prevalence of the Bora, our old friend Boreas, which generally raises a surcharge along the coast of Italy. In many straits and narrow arms of the sea there is a periodical flux and reflux, but the only place where tidal influence,

properly so called, is unmistakably observed is in the Lesser Syrtis, or Gulf of Gabes, where the tide runs at the rate of two or three knots an hour, and the rise and fall varies from 3 to 8 feet. It is most marked and regular at Djerba, the Homeric island of the Lotophagi: one must be careful in landing there in a boat, so as not to be left high and dry a mile or two from the shore. Perhaps the companions of Ulysses were caught by the receding tide, and it was not only a banquet of dates, the "honey-sweet fruit of the Lotus," or the potent wine which is made from it, which made them "forgetful of their homeward way."

The Gulf of Gabes naturally calls to mind the proposals which were made a few years ago for inundating the Sahara, and so restoring to the Atlantic region the insular condition which it is alleged to have had in prehistoric times. I will not allude to the English project for introducing the waters of the Atlantic from the west coast of Africa; that does not belong to my subject. The French scheme, advocated by Commandant Roudaire and supported by M. de Lesseps, was quite as visionary and impracticable.

To the south of Algeria and Tunis there exists a great depression, stretching westwards from the Gulf of Gabes to a distance of about 235 miles, in which are several *chotts* or salt lakes, sometimes only marshes, and in many places covered with a saline crust strong enough to bear the passage of camels. Commandant Roudaire proposed to cut through the isthmuses which separated the various *chotts*, and so prepare their basins to receive the waters of the Mediterranean. This done, he intended to introduce the sea by a canal, which should have a depth of one mètre below low-water level.

This scheme was based on the assumption that the basin of the *chotts* had been an inland sea within historic times; that, little by little, owing to the difference between the quantity of water which entered and the amount of evaporation and absorption, this interior sea had disappeared, leaving the *chotts* as an evidence of the former condition of things; that, in fact, this was none other than the celebrated Lake Triton, the position of which has always been a puzzle to geographers.

This theory, however, is untenable; the Isthmus of Gabes is not a mere sandbank; there is a band of rock between the sea and the basin of the *chotts*, through which the former never could have penetrated in modern times. It is much more probable that Lake Triton was the large bight between the Island of Djerba and the mainland, on the shores of which are the ruins of the ancient city of Meninx, which, to judge by the abundance of Greek marble found there, must have carried on an important commerce with the Levant.

The scheme has now been entirely abandoned; nothing but the mania for cutting through isthmuses all over the world, which followed the brilliant success achieved at Suez, can explain its having been started at all. Of course, no mere mechanical operation is impossible in these days, but the mind refuses to realise the possibility of vessels circulating in a region which produces nothing, or that so small a sheet of water in the immensity of the Sahara could have any appreciable effect in modifying the climate of its shores.

The Eastern Basin is much more indented and cut up into separate seas than the Western one; it was therefore better adapted for the commencement of commerce and navigation; its high mountains were landmarks for the unpractised sailor, and its numerous islands and harbours afforded shelter for his frail barque, and so facilitated communication between one point and another.

The advance of civilisation naturally took place along the axis of this sea, Phœnicia, Greece, and Italy being successively the great nurseries of human knowledge and progress. Phœnicia had the glory of opening out the path of ancient

commerce, for its position in the Levant gave it a natural command of the Mediterranean, and its people sought the profits of trade from every nation which had a seaboard on the three continents washed by this sea. Phœnicia was already a nation before the Jews entered the Promised Land, and, when they did so, they carried on inland traffic as middlemen to the Phœnicians. Many of the commercial centres on the shores of the Mediterranean were founded before Greece and Rome acquired importance in history. Homer refers to them as daring traders nearly a thousand years before the Christian era.

For many centuries the commerce of the world was limited to the Mediterranean, and when it extended in the direction of the East, it was the merchants of the Adriatic, of Genoa, and of Pisa who brought the merchandise of India, at an enormous cost, to the Mediterranean by land, and who monopolised the carrying trade by sea. It was thus that the elephant trade of India, the caravan traffic through Babylon and Palmyra, as well as the Arab *kafilahs*, became united with the occidental commerce of the Mediterranean.

As civilisation and commerce extended westwards, mariners began to overcome their dread of the vast solitudes of the ocean beyond the Pillars of Hercules, and the discovery of America by Columbus, and the circumnavigation of Africa by the Portuguese, changed entirely the current of trade as well as increased its magnitude, and so relegated the Mediterranean, which had hitherto been the central sea of human intercourse, to a position of secondary importance.

Time will not permit me to enter into further details regarding the physical geography of this region, and its history is a subject so vast that a few episodes of it are all that I can possibly attempt. It is intimately connected with that of every other country in the world, and here were successively evolved all the great dramas of the past and some of the most important events of less distant ages.

As I have already said, long before the rise of Greece and Rome, its shores and islands were the seat of an advanced civilisation. Phœnicia had sent out her pacific colonies to the remotest parts, and no insignificant vestiges of their handicraft still exist to excite our wonder and admiration. We have the megalithic temples of Malta sacred to the worship of Baal, the generative god, and Ashtoreth, the conceptive goddess, of the universe. The three thousand *nurhagi* of Sardinia, round towers of admirable masonry, intended probably for defence in case of sudden attack, and the so-called giant graves, were as great a mystery to classical authors as they are to us at the present day. Minorca has its *talayots*, tumuli somewhat analogous to, but of ruder construction than, the *nurhagi*, more than 200 groups of which exist in various parts of the island; with these are associated subordinate constructions intended for worship; altars composed of two immense monoliths, erected in the form of a T; sacred enclosures and megalithic habitations. One type of *talayot* is especially remarkable, of better masonry than the others, and exactly resembling inverted boats. One is tempted to believe that the Phœnicians had in view the grass habitations, or *mapalia*, of the Numidians described by Sallust, and had endeavoured to reproduce them in stone: *Oblonga incurvis lateribus tecta, quasi navium carinae sunt*.

For a long time the Phœnicians had no rivals in navigation, but subsequently the Greeks—especially the Phocians—established colonies in the Western Mediterranean, in Spain, Corsica, Sardinia, Malta, and the South of France, through the means of which they propagated not only their commerce, but their arts, literature, and ideas. They introduced many valuable plants, such as the olive, thereby modifying profoundly the agriculture of the countries in which they settled. They

have even left traces of their blood, and it is no doubt to this that the women of Provence owe the classical beauty of their features.

But they were eclipsed by their successors. The empire of Alexander opened out a road to India, in which, indeed, the Phœnicians had preceded him, and introduced the produce of the East into the Mediterranean; while the Tyrian colony of Carthage became the capital of another vast empire, which, from its situation, midway between the Levant and the Atlantic Ocean, enabled it to command the Mediterranean traffic.

The Carthaginians at one time ruled over territory extending along the coast from Cyrene to Numidia, besides having a considerable influence over the interior of the continent, so that the name of Africa, given to their own dominions, was gradually applied to a whole quarter of the globe. The ruling passion with the Carthaginians was love of gain, not patriotism, and their wars were largely fought with mercenaries. It was the excellence of her civil constitution which, according to Aristotle, kept in cohesion for centuries her straggling possessions. A country feebly patriotic, which intrusts her defence to foreigners, has the seeds of inevitable decay, which ripened in her struggle with Rome, despite the warlike genius of Hamilkar and the devotion of the magnanimous Hannibal. The gloomy and cruel religion of Carthage, with its human sacrifices to Moloch and its worship of Baal under the name of Melcarth, led to a criminal code of Draconic severity and alienated it from surrounding nations. When the struggle with Rome began, Carthage had no friends. The first Punic War was a contest for the possession of Sicily, whose prosperity is even now attested by the splendour of its Hellenic monuments. When Sicily was lost by the Carthaginians, so also was the dominion of the sea, which hitherto had been uncontested. The Second Punic War resulted in the utter prostration of Carthage and the loss of all her possessions out of Africa, and in 201 B.C., when this war was ended, 552 years after the foundation of the city, Rome was mistress of the world.

The destruction of Carthage after the third Punic War was a heavy blow to Mediterranean commerce. It was easy for Cato to utter his stern *Delenda est Carthago*; destruction is easy, but construction is vastly more difficult. Although Augustus in his might built a new Carthage near the site of the old city, he could never attract again the trade of the Mediterranean which had been diverted into other channels. Roman supremacy was unfavourable to the growth of commerce, because, though she allowed unrestricted trade throughout her vast empire and greatly improved internal communications in the subjugated countries, Rome itself absorbed the greater part of the wealth and did not produce any commodities in return for its immense consumption, and therefore Mediterranean commerce did not thrive under the Roman rule. The conquest of Carthage, Greece, Egypt, and the East poured riches into Rome, and dispensed for a time with the needs of productive industry, but formed no enduring basis of prosperity.

The final partition of the Roman empire took place in 365; forty years later the barbarians of the North began to invade Italy and the South of Europe, and in 429 Genseric, at the head of his Vandal hordes, crossed over into Africa from Andalusia, a province which still bears their name, devastating the country as far as the Cyrenaica. He subsequently annexed the Balearic Islands, Corsica, and Sardinia; he ravaged the coasts of Italy and Sicily, and even of Greece and Illyria; but the most memorable of his exploits was the unresisted sack of Rome, whence he returned to Africa laden with treasure and bearing the Empress Eudoxia a captive in his train.

The degenerate emperors of the West were powerless to avenge this insult, but

Byzantium, though at this time sinking to decay, did make a futile attempt to attack the Vandal monarch in his African stronghold. It was not, however, till 533, in the reign of Justinian, when the successors of Genseric had fallen into luxurious habits and had lost the rough valour of their ancestors, that Belisarius was able to break their power and take their last king a prisoner to Constantinople. The Vandal domination in Africa was destroyed, but that of the Byzantines was never thoroughly consolidated; it rested, not on its own strength, but on the weakness of its enemies, and it was quite unable to cope with the next great wave of invasion which swept over the land, perhaps the most extraordinary event in the world's history, save only the introduction of Christianity.

In 647, twenty-seven years after the Hedjira of Mohammed, Abdulla ibn Saad started from Egypt for the conquest of Africa with an army of 40,000 men.

The expedition had two determining causes—the hope of plunder and the desire to promulgate the religion of El Islam. The sands and scorching heat of the desert, which had nearly proved fatal to the army of Cato, were no bar to the hardy Arabians and their enduring camels. The march to Tripoli was a fatiguing one, but it was successfully accomplished; the invaders did not exhaust their force in a vain effort to reduce its fortifications, but swept on over the Syrtic desert and north to the province of Africa, where, near the splendid city of Suffetula, a great battle was fought between them and the army of the Exarch Gregorius, in which the Christians were signally defeated, their leader killed, and his daughter allotted to Ibn ez-Zobair, who had slain her father.

Not only did the victorious Moslems overrun north Africa, but soon they had powerful fleets at sea which dominated the entire Mediterranean, and the emperors of the East had enough to do to protect their own capital.

Egypt, Syria, Spain, Provence, and the islands of the Mediterranean successively fell to their arms, and, until they were checked at the Pyrenees by Charles Martell it seemed at one time as if the whole of Southern Europe would have been compelled to submit to the disciples of the new religion. Violent, implacable, and irresistible at the moment of conquest, the Arabs were not unjust or hard masters in countries which submitted to their conditions. Every endeavour was, of course, made to proselytise, but Christians were allowed to preserve their religion on payment of a tax, and even Popes were in the habit of entering into friendly relations with the invaders. The Church of St. Cyprian and St. Augustine, with its 500 Sees, was indeed expunged, but five centuries after the passage of the Mohammedan army from Egypt to the Atlantic a remnant still existed. It was not till the twelfth century that the religion and language of Rome became utterly extinguished.

The Arabs introduced a state of high civilisation into the countries where they settled; their architecture is the wonder and admiration of the world at the present day; their irrigational works in Spain have never been improved upon; they fostered literature and the arts of peace, and introduced a system of agriculture far superior to what existed before their arrival.

Commerce, discouraged by the Romans, was highly honoured by the Arabs, and during their rule the Mediterranean recovered the trade which it possessed in the time of the Phœnicians and Carthaginians; it penetrated into the Indian Archipelago and China; it travelled westward to the Niger, and to the east as far as Madagascar, and the great trade route of the Mediterranean was once more developed.

The power and prosperity of the Arabs culminated in the ninth century, when Sicily fell to their arms; it was not, however, very long before their empire began

to be undermined by dissensions; the temporal and spiritual authority of the Omniade Khalifs, which extended from Sind to Spain, and from the Oxus to Yemen, was overthrown by the Abbassides in the year 132 of the Hedjira, A.D. 750. Seven years later Spain detached itself from the Abbasside empire; a new Khaliphate was established at Cordova, and hereditary monarchies began to spring up in other Mohammedan countries.

The Carolingian empire gave an impulse to the maritime power of the South of Europe, and in the Adriatic the fleets of Venice and Ragusa monopolised the traffic of the Levant. The merchants of the latter noble little republic penetrated even to our own shores, and Shakespeare has made the Argosy or Ragusie a household word in our language.

During the eleventh century the Christian Powers were no longer content to resist the Mohammedans; they began to turn their arms against them. If the latter ravaged some of the fairest parts of Europe, the Christians began to take brilliant revenge.

The Mohammedans were driven out of Corsica, Sardinia, Sicily, and the Balearic Islands, but it was not till 1492 that they had finally to abandon Europe after the conquest of Granada by Ferdinand and Isabella.

About the middle of the eleventh century an event took place which profoundly modified the condition of the Mohammedan world. The Khaliph Mostansir let loose a horde of nomad Arabs, who, starting from Egypt, spread over the whole of North Africa, carrying destruction and blood wherever they passed, thus laying the foundation for the subsequent state of anarchy which rendered possible the interference of the Turks.

English commercial intercourse with the Mediterranean was not unknown even from the time of the Crusades, but it does not appear to have been carried on by means of our own vessels till the beginning of the sixteenth century. In 1522 it was so great that Henry VIII. appointed a Cretan merchant, Censio de Balthazari, to be "Master, governor, protector, and consul of all and singular the merchants and others his lieges and subjects within the port, island, and country of Crete or Candia." This is the very first English consul known to history, but the first of English birth was my own predecessor in office, Master John Tipton, who, after having acted at Algiers during several years in an unofficial character, probably elected by the merchants themselves to protect their interests, was duly appointed consul by Sir William Harebone, ambassador at Constantinople in 1585, and received just such an exequatur from the Porte as has been issued to every consul since by the government of the country in which he resides.

Piracy has always been the scourge of the Mediterranean, but we are too apt to associate its horrors entirely with the Moors and Turks. The evil had existed from the earliest ages; even before the Roman conquest of Dalmatia the Illyrians were the general enemies of the Adriatic; Africa under the Vandal reign was a nest of the fiercest pirates; the Venetian chronicles are full of complaints of the ravages of the corsairs of Ancona, and there is no other name but piracy for such acts of the Genoese as the unprovoked pillage of Tripoli by Andrea Doria in 1535. To form a just idea of the corsairs of the past it is well to remember that commerce and piracy were often synonymous terms, even among the English, up to the reign of Elizabeth. Listen to the description given by the pious Cavendish of his commercial circumnavigation of the globe: "It hath pleased Almighty God to suffer me to circumpass the whole globe of the world. . . . I navigated along the coast of Chili, Peru, and New Spain, where I made great spoils. All the villages and towns that ever I landed at I burned and spoiled, and had I not been discovered

upon the coast I had taken a great quantity of treasure," and so he concludes, "The Lord be praised for all His mercies!"

Sir William Monson, when called upon by James I. to propose a scheme for an attack on Algiers, recommended that all the maritime powers of Europe should contribute towards the expense, and participate in the gains from the sale of Moors and Turks as slaves.

After the discovery of America and the expulsion of the Moors from Spain, piracy developed to an extraordinary extent. The audacity of the Barbary corsairs seems incredible at the present day; they landed on the shores and islands of the Mediterranean, and even extended their ravages to Great Britain, carrying off all the inhabitants whom they could seize into the most wretched slavery. The most formidable of these piratical states was Algiers, a military oligarchy, consisting of a body of janissaries, recruited by adventurers from the Levant, the outcasts of the Mohammedan world, criminals and renegades from every nation in Europe. They elected their own ruler or Dey, who exercised despotic sway, tempered by frequent assassination; they oppressed without mercy the natives of the country, accumulated vast riches, had immense numbers of Christian slaves, and kept all Europe in a state bordering on subjection by the terror which they inspired. Nothing is sadder or more inexplicable than the shameful manner in which this state of things was accepted by civilised nations. Many futile attempts were made during successive centuries to humble their arrogance, but it only increased by every manifestation of the powerlessness of Europe to restrain it. It was reserved for our own countryman, Lord Exmouth, by his brilliant victory in 1816, for ever to put an end to piracy and Christian slavery in the Mediterranean. His work, however, was left incomplete, for though he destroyed the navy of the Algerines, and so rendered them powerless for evil on the seas, they were far from being humbled; they continued to slight their treaties and to subject even the agents of powerful nations to contumely and injustice. The French took the only means possible to destroy this nest of ruffians, by the almost unresisted occupation of Algiers and the deportation of its Turkish aristocracy.

They found the whole country in the possession of a hostile people, some of whom had never been subdued since the fall of the Roman Empire, and the world owes France no small debt of gratitude for having transformed what was a savage and almost uncultivated country into one of the richest as well as the most beautiful in the basin of the Mediterranean.

What has been accomplished in Algeria is being effected in Tunisia. The treaty of the Kasr-es-Saeed, which established a French Protectorate there, and the military occupation of the Regency, were about as high-handed and unjustifiable acts as are recorded in history; but there can be no possible doubt regarding the important work of civilisation and improvement that has resulted from them. European courts of justice have been established all over the country; the exports and imports have increased from 23 to 51 millions of francs, the revenue from 6 to 19 millions, without the imposition of a single new tax, and nearly half a million per annum is being spent on education.

Sooner or later the same thing must happen in the rest of North Africa, though at present international jealousies retard this desirable consummation. It seems hard to condemn such fair countries to continued barbarism, in the interest of tyrants who misgovern and oppress their people. The day cannot be far off when the whole southern shores of the Mediterranean will enjoy the same prosperity and civilisation as the northern coast, and when the deserts, which are the result of misgovernment and neglect, will assume the fertility arising from security and industry, and will again blossom as the rose.

It cannot be said that any part of the Mediterranean basin is still unknown, if we except the empire of Morocco. But even that country has been traversed in almost every direction during the past twenty years, and its geography and natural history have been illustrated by men of the greatest eminence; such as Gerhard Rohlfs, Monsieur Tissot, Sir Joseph Hooker, the Vicomte de Foucauld, Joseph Thomson, and numerous other travellers. The least-known portion, at least on the Mediterranean coast, is the Riff country, the inhospitality of whose inhabitants has given the word "ruffian" to the English language. Even that has been penetrated by De Foucauld disguised as a Jew, and the record of his exploration is one of the most brilliant contributions to the geography of the country which has hitherto been made.

Although, therefore, but little remains to be done in the way of actual exploration, there are many by-ways of travel comparatively little known to that class of the community with which I have so much sympathy, the ordinary British tourist. These flock every year in hundreds to Algeria and Tunis, but few of them visit the splendid Roman remains in the interior of those countries. The Cyrenaica is not so easily accessible, and I doubt whether any Englishmen have travelled in it since the exploration of Smith and Porcher in 1861.

Cyrene almost rivalled Carthage in commercial importance. The Hellenic ruins still existing bear witness to the splendour of its five great cities. It was the birthplace of many distinguished people, and amongst its hills and fountains were located some of the most interesting scenes in mythology, such as the Gardens of the Hesperides and the "Silent, dull, forgetful waters of Lethe."

This peninsula is only separated by a narrow strait from Greece, whence it was originally colonised. There, and indeed all over the eastern basin of the Mediterranean, are many little-trodden routes; but the subject is too extensive; I am reluctantly compelled to restrict my remarks to the western half.

The south of Italy is more frequently traversed and less travelled in than any part of that country. Of the thousands who yearly embark or disembark at Brindisi, few ever visit the Land of Manfred. Otranto is only known to them from the fanciful descriptions in Horace Walpole's romance. The general public in this country is quite ignorant of what is going on at Taranto and of the great arsenal and dockyard which Italy is constructing in the Mare Piccolo, an inland sea containing more than 1000 acres of anchorage for the largest ironclads afloat, yet with an entrance so narrow that it is spanned by a revolving bridge. Even the Adriatic, though traversed daily by steamers of the Austrian Lloyd's Company, is not a highway of travel; yet where is it possible to find so many places of interest within the short space of a week's voyage, as between Corfu and Trieste, along the Dalmatian and Istrian shores, and among the islands that fringe the former, where it is difficult to realise that one is at sea at all, and not on some great inland lake?

There is the Bocche di Cattaro, a vast rent made by the Adriatic among the mountains, where the sea flows round their spurs in a series of canals, bays, and lakes of surpassing beauty. The city of Cattaro itself, the gateway of Montenegro, with its picturesque Venetian fortress, nestling at the foot of the black mountain; Ragusa, the Roman successor of the Hellenic Epidaurus, Queen of the Southern Adriatic, battling with the waves on her rock-bound peninsula, the one spot in all that sea which never submitted either to Venice or the Turk, and for centuries resisted the barbarians on every side, absolutely unique as a mediæval fortified town, and worthy to have given her name to the argosies she sent forth; Spalato, the grandest of Roman monuments; Lissa, colonised by Dionysius of Syracuse, and memorable to us as having been a British naval station from 1812 to 1814, while

the French held Dalmatia ; Zara, the capital, famous for its siege by the Crusaders, interesting from an ecclesiological point of view, and venerated as the last resting-place of St. Simeon, the prophet of the *Nunc dimittis* ; Parenza, with its great basilica ; Pola, with its noble harbour, whence Belisarius sailed forth, now the chief naval port of the Austrian empire, with its Roman amphitheatre and graceful triumphal arches ; besides many other places of almost equal interest. Still further west are Corsica, Sardinia, and the Balearic Islands, all easily accessible from the coasts of France, Italy, and Spain. Their ports are constantly visited by mail steamers and private yachts, yet they are but little explored in the interior.

I am tempted to linger a little over one of the places I have just mentioned, and to devote more time to a physical and historical description of Corsica than I can spare for the Mediterranean generally. It is replete with all that makes travel delightful—unequalled scenery, a brilliant climate, historical associations, and the study of a race of men who still retain their national peculiarities. The facilities for travelling are as great as can be fairly expected ; roads such as none but the French seem able to make, winding along steep coasts and over high mountains, plunging into the depths of shady valleys and amongst dark forests in search of what is so dear to a French engineer's heart, a uniform gradient, and metalled with granite so hard that in the driest weather they are free from dust. I may add that I never failed to find sufficiently good accommodation and a kindly reception in the smallest and most remote villages.

Corsica has been compared in shape to a closed hand with the index finger extended, the latter being the promontory, called Cap Corse. The island is traversed in its whole length by a chain of high mountains, the general direction of which is north and south, dividing it into two parts of nearly equal extent. Placed, as it is, in the centre of the Western Mediterranean, between the Alps and the Atlas, and with so great inequalities of surface, it presents an epitome of the whole region from the warm sea-level to the Alpine character of the interior, where the mountains rise to a height of nearly 9000 feet, and are clothed in snow during the greater part of the year.

All the western coast, and more than two-thirds of the whole island, are of granitic formation. The central range throws out spurs towards the sea, forming on the western side numerous bays of considerable size and depth. Nothing can exceed the grandeur of the scenery on the coast, which culminates in the celebrated Calanches de Piana, a succession of stupendous granite rocks worn and hollowed out in the most fantastic manner, fearful in their forms but soft and lovely in their colouring. There are many similar rocks throughout the island, such as the Calanches d'Evisa, the Fourches d'Asinao, and the Gorge of Inzeca, where a river flows between great cliffs and amongst boulders of green serpentine, a sight never to be forgotten.

The eastern side of the island consists of primary rocks, more or less easily disintegrated, the detritus being washed down by rains so as to form the low plains bordering that coast. As the rivers force their way through them with difficulty, marshes and lagoons are created. These are hotbeds of malarious fever in summer, dangerous even for the natives, who migrate to the hills at that season.

The forests, the great glory of the island, consist chiefly of oak, beech, birch, and the *Pinus laricio*, indigenous to Corsica, and the monarch of European conifers, which rises as straight as an arrow, sometimes to a height of 120 or 150 feet.

The Castagniccia, or country of the chestnut, is an extensive and very beautiful district, especially when the trees are in full leaf. The fruit is more useful to the people who inhabit the district than even the date to the Arab. He has to cultivate his palm-trees laboriously, irrigate them in summer, and pick the fruit with

the greatest care. The chestnut demands no such attention ; it grows spontaneously, requires no cultivation, and the fruit falls of itself when sufficiently ripe. It is the staple food of the people, who eat it in every form, even giving it to their cattle instead of grain, while the sale of the surplus furnishes them with the other necessities of life.

After the forests the most pleasing feature in the island, and covering more than half its surface, is the *macchie*, or brushwood, before mentioned, spreading its delicious perfume through the air and lighting up the landscape with a blaze of colour. There is also a constant succession of wild-flowers, liliaceous plants, orchids, cyclamen, and many others. In one pine wood I saw the ground carpeted with violets and primroses, while ferns, from the common bracken to the noble *Osmunda regalis*, are found everywhere.

The principal towns are Ajaccio on the south-west, a well-known winter station, the capital of the island, full of memories and memorials of Napoleon ; Bastia to the north-east, the commercial capital ; Calvi to the north-west, a picturesque stronghold rising high above the sea, and dominating the surrounding country. The last is one of the few places that were always faithful to the Genoese cause, and it still bears over the entrance gate the inscription, *Civitas Calvi semper fidelis*. It made a desperate resistance to the English in 1794 under Hood and Nelson, who reduced it almost to a heap of ruins before it surrendered. Nelson lost his eye in the engagement. A local antiquary has tried to prove that Columbus was born here, of Genoese parents, though he left at an early age for Genoa.

Corte, in the interior of the island, the ancient feudal capital, was the chief seat of Paoli's government, as well as the headquarters of the short-lived English administration under Sir Gilbert Elliot. It is situated at the confluence of two rivers, the Restonico and the Tavignano, which descend to the plains through a series of magnificent gorges. High above the town, perched on the summit of a rock, is the picturesque citadel built in the beginning of the fifteenth century.

In the extreme south is Bonifacio, another ancient fortress, not only strange and beautiful in itself, but commanding fine views from its ramparts of Sardinia and the numerous islands on both sides of the Straits.

Carghese, 28 miles north of Ajaccio, is exceptionally interesting. In 1676 an emigration of about 1000 Greeks from Maina, in the Morea, wearied with Turkish oppression, took place to Genoa, whence they were sent to Corsica. A second emigration of 400 started to join them in the following year, but they were overtaken by the Turkish fleet and massacred. The prosperity of the small colony was not of long duration, because, when the insurrection in Corsica against the Genoese broke out, the Greeks, out of gratitude to their protectors, refused to join in it. In consequence their villages were destroyed, their lands confiscated, and their flocks driven away. They fled for refuge to Ajaccio, and there remained till the advent of the French. It was one of the first acts of Comte Marbeuf, on assuming the government of the island, to reinstate them in a new domain, and he it was who built the present town of Carghese. The inhabitants, though in full communion with the Church of Rome, still retain their Greek Liturgy, and to some extent their language, and live on the most cordial terms with their Latin neighbours.

The vendetta has always been one of the characteristic customs of Corsica, although prevailing more in some parts of the island than in others. Such feuds have been pursued with inveterate pertinacity, frequently involving whole families from one generation to another. The custom originated in times when Genoese justice was venal and corrupt, and men had to take the honour of their families

into their own keeping. After having accomplished their vendetta, the "bandits, as they are called, are accustomed to take refuge in the *macchie*, but they are never to be confounded with robbers, and there is no instance of strangers being molested by them.

Corsica has an important ancient history, but time will not permit me to enter into this subject in any detail; one episode, however, is especially interesting. Seneca passed eight years here in exile: a tower is pointed out on the west coast of Cap Corse which is said to have served as his prison. Even the glorious views of sea and land which it commands could not compensate him for compulsory banishment from the fertile plains of Italy.

Nor is this the place even to summarise the modern history of the island, though nothing can be more interesting than the story of the Pisan domination, the long and tyrannical rule of the Genoese, the struggle of the islanders during four centuries to gain their independence, the mock kingdom of Theodore, the wise rule of Pasquale Paoli, the unfortunate English occupation, and the subsequent conquest of the island by France.

I have endeavoured to sketch, necessarily in a very imperfect manner, the physical character and history of the Mediterranean, to show how the commerce of the world originated in a small maritime state at its eastern extremity; how it gradually advanced westward till it burst through the Straits of Gibraltar, and extended over seas and continents until then undreamt of, an event which deprived the Mediterranean of that commercial prosperity and greatness which for centuries had been limited to its narrow basin.

Once more this historic sea has become the highway of nations; the persistent energy and genius of two men have revolutionised navigation, opened out new and boundless fields for commerce, and it is hardly too much to say that if the Mediterranean is to be restored to its old position of importance, if the struggle for Africa is to result in its regeneration, as happened in the new world, if the dark places still remaining in the further East are to be civilised, it will be in a great measure due to Waghorn and Ferdinand de Lesseps, who developed the overland route and created the Suez Canal.

But the Mediterranean can only hope to retain its regenerated position in time of peace. Nothing is more certainly shown by past history than that war and conquest have changed the route of commerce in spite of favoured geographical positions. Babylon was conquered by Assyrians, Persians, Macedonians, and Romans, and though for a time her position on the Euphrates caused her to rise like a phoenix from her ashes, successive conquests, combined with the luxury and effeminacy of her rulers, caused her to perish. Tyre, conquered by Nebuchadnezzar and Alexander, fell as completely as Babylon had done, and her trade passed to Alexandria. Ruined sites of commercial cities rarely again become emporia of commerce; Alexandria is an exception dependent on very exceptional circumstances.

The old route to the East was principally used by sailing vessels, and was abandoned for the shorter and more economical one by the Suez Canal, which now enables a round voyage to be made in 60 days, which formerly required from six to eight months. This, however, can only remain open in time of peace. It is quite possible that in the event of war the old route by the Cape may be again used, to the detriment of traffic by the Mediterranean. Modern invention has greatly economised the use of coal, and steamers, by the use of duplex and triplex engines, can run with a comparatively small consumption of fuel, thus leaving a larger space for cargo. England, the great carrying power of the world, may find it more advantageous to trust to her own strength and the security of the open seas

than to run the gauntlet of the numerous stragetical positions in the Mediterranean, such as Port Mahon, Bizerta, and Taranto, each of which is capable of affording impregnable shelter to a hostile fleet; and though the ultimate key to the Indian Ocean is in our own hands, our passage to it may be beset with a thousand dangers. There is no act of my career on which I look back with so much satisfaction as on the share I had in the occupation of Perim, one of the most important links in that chain of coaling stations which extends through the Mediterranean to the further East, and which is so necessary for the maintenance of our naval supremacy. It is a mere islet, it is true, a barren rock, but one surrounding a noble harbour, and so eminently in its right place that we cannot contemplate with equanimity the possibility of it being in any other hands than our own.

It is by no means certain whether exaggerated armaments are best suited for preserving peace or hastening a destructive war; the golden age of disarmament and international arbitration may not be near at hand, but it is even now talked of as a possibility.

Should the poet's prophecy or the patriot's dream be realised, and a universal peace indeed bless the world, then this sea of so many victories may long remain the harvest-field of a commerce nobler than conquest.

APPENDIX B.

JOINT MEETING OF THE GEOGRAPHICAL AND ECONOMIC SCIENCE SECTIONS.

In the Albert Hall, Leeds, a Conference took place between the Geographical and the Economic Science and Statistical Sections, the object being to consider the subject of "The lands of the globe still available for European settlement." Lieut.-Colonel Sir R. Lambert Playfair, President of the Geographical Section, presided.

After a few introductory words from the President, Mr. E. G. RAVENSTEIN, in opening the discussion, remarked that the fact that there were present so large a number of distinguished economists proved that on that account geography and political economy would go hand in hand and learn from each other while acting as instructors of the public. In entering upon the subject, he had shut out from consideration those Arctic and Antarctic regions within which the growth of cereals was impossible, or next to impossible; and he had divided his area—the whole earth—into certain belts. They had first of all the Arctic region, which he left entirely out of consideration. Then they had a region within which agriculture promised best, and which included the whole of Europe, with the exception of part of Russia; and this he called the cultivable lands. The next belt was that of poorish grass lands and lands of that description, which, looked at as a whole, was less fertile than the other. And, lastly, they had the desert lands. The whole of the area within the limits of which the growth of cereals was possible comprised over 46,000,000 square miles, and out of that the fertile or comparatively fertile land covered over 28,000,000 square miles. The barren grass lands, or steppes, comprised nearly 14,000,000, and the deserts 4,180,000 square miles. In regard to the number of human inhabitants, of a very considerable part of the world they did not know the population. Of that of Africa they knew very little; and even of that of China they were not at all certain; he had therefore been obliged to go by analysis, except in those cases where he had been able to get the exact figures. He had estimated the population of the cultivable

area in the present year at 1,468,000,000. He had been exceptionally careful with regard to Africa ; and he could not conscientiously give that continent more than 127,000,000—instead of the 200,000,000, or 300,000,000, or 400,000,000 which certain people would have us to believe as the correct number. Even 127,000,000 meant eleven people to the square mile ; and that was a high figure. In Australia there were not $1\frac{1}{2}$ to a square mile ; in North America there were 14 ; while in South America there were only 5. In Europe they had 101 persons to the square mile. The population was densest in the western part of Europe ; the land certainly was no longer able to support it, and they were obliged to send out of the country every year thousands of emigrants. He found that the population of the world increased 8 per cent. every ten years. Europe grew at the rate of 8 per cent., and he allowed for Asia an increase of 6 per cent. Africa he had given 10 per cent. ; but at the present time the population there scarcely increased at all. For the purposes of his inquiry, however, he had assumed that order would be established in Africa, and that the inter-tribal wars would cease. The Slave Trade, as they knew, had been checked ; compulsory migration had been put an end to ; and there was even a chance of people crowding into Africa,—and possibly dying there. In Australia they found an increase of 30 per cent., which of course included immigrants ; in North America 20 per cent. ; and in the United States and Canada, together, 22 per cent. In South America he could only give 5 per cent., owing to the very mixed population, which was unable to rival the more strictly European elements in the northern colonies as regarded increase of population. What they wanted to know was, How long they would be allowed to continue in the improvident way they had been going on hitherto : in a word, how long the land would hold out ? He had tried to arrive at an estimate ; and he might say at once that the answer to the question would be subject to certain changes, say, in the standard of life. He had not the least doubt there were some vegetarians at that meeting ; he could distinguish them. They would say, that if a vegetarian diet were introduced, three men might live where one lived now, and that six men might take the place of a horse. If the earth were full, he would call up a medical board, who would reduce or change their diet allowance. He would allow them porridge or other nutritious things ; and if Dr. Richardson were there, no doubt he would succeed in producing some new plant that contained all the nutriment of rump-steak without compelling them to be so cruel as to kill animals, or so wasteful as to allow animals to eat grass, which they themselves ought to eat. Probably some Yorkshireman would say that they could improve the land by their methods of cultivation until it yielded a great deal more than it does now ; but he rejected that point altogether. He accepted the European standard as it was now ; but he did allow for a slight improvement, in view of the better harvests which they could trace in past agricultural returns. They must not, however, expect very great things from those improvements ; and they must not forget that a large share of the improvements would be needed in order to give them better food than they had had hitherto. He was sure there were a good many millions of people on the face of the earth who ought to have better food than they were now able to procure. They must not expect 600 Englishmen to make a living out of a square mile, and have something left to pay for rent and clothing. That was impossible. Nor, on the other hand, did he expect that the men of the future would prove such excellent agriculturists as the American. In course of time the forests that had been destroyed in America would be recoverable, and fresh ones might be planted. In Europe even, where forests were not so necessary as in the United States, 25 per cent. were kept upon the land. As to the number of people who could be sustained in the various belts indicated, he had arrived at

the following conclusion :—To the desert regions he allocated a population of one to the square mile ; and to the poor grass lands, or steppes, he apportioned a population of ten to the square mile, on an average. Thus, in the deserts there would be 180,000, and in the steppes 139,000,000 human beings. To decide the population of the cultivable area was more difficult ; but he had taken representative areas, and had estimated their average population. In Europe he took the whole central region, from the Netherlands to the Black Sea, a region fairly well cultivated up to its capacity, though further improvements of method might be taken to equalise the amount of food exports and imports. Here there were 156 inhabitants to the square mile ; and he argued that similar areas in other parts of the world would sustain the same density of population. Taking India next, he found a population of 175 to the square mile, fairly supported, according to the prevailing mode of life. China supported a population of 295, and Japan 264, to the square mile. Taking these figures together, he arrived at the conclusion that a world-population of 207 to the square mile was a moderate estimate. Thus, the total population of the cultivable area, supposing the present standard of life to be maintained, would be 5,850,700,000, and the total number which the earth could feed was 5,994,000,000. They must not forget that their American cousins, instead of giving a lesson to Europe, had wasted their resources in a style in which Europe had never done. But these things would come right—in fact, the people would insist upon their being put right. If they travelled in America, and went south as far as Washington, they would find millions of acres that were once most productive, and were even now lovely to look upon, but nothing grew there. This land in the Eastern States, which, by the system of agriculture, was exhausted, would recover, of course. The Americans knew how to cultivate with care if they were driven to it ; and they would very soon be more careful about their land. Alluding to the question of settlement in Tropical countries, he remarked that they had heard a great deal about it. Only quite recently a Dutch doctor, at a medical congress, stated that there was absolutely no difficulty in Europeans becoming acclimatised in Tropical countries : he did not mean that Europeans could live in those countries for three, or twenty, or one hundred years, but that they and their descendants could live there for generations. That was what acclimatisation meant ; and if that were so, it had not been proved to succeed anywhere. They knew that southern races were better fitted for work in Tropical countries than were northern people. Let the Italians go to warm climates, and let us take Italy ! Who were living in France ? Did they think it was the French ? France was being occupied inch by inch by Germans and Belgians, who walked in from the north. They all desired to improve their position ; and here was this strange fact, that after a generation or so all these immigrants became Frenchmen, and some very tough Frenchmen too. Northern Frenchmen perished in Algeria ; the southern Frenchmen prospered there. The people of the Sudan were going to the south ; and the Boers in South Africa, from a comparatively healthy district, were making their way to the north. The Portuguese had gone to Brazil, but how slowly the population was increasing there ! Many returned to Portugal with fortunes, and their places were continuously being filled by others from Europe. Stop the supplies and they would die out. Perhaps, even in the United States, if they stopped the supply of European immigrants they might stop the growth of population. Unfortunately, population statistics were still very incomplete. Perhaps this was the way of Providence, to provide for the slow and painless extinction of the human race, and to prevent that over-population which people talked about. He did not think that Tropical climates were adapted to the acclimatisation of European races, in the sense in

which that word was generally used. They knew that the health of Europeans in Tropical countries had improved owing to sanitary measures; but that was not all. Mortality was still very great; and, though it had been said that out of one hundred men in the service of the Congo State only six died, he appealed to his Economic friends and asked them whether a mortality of sixty in the 1000 in the healthiest men, not one of whom had gone there without a medical certificate, was anything so very wonderful. He said no. Population in some countries did not increase; and, stranger still, where they could compare the facts collected in the same country, they found that the superior race increased at a slower rate than the inferior race. That would, in course of time, keep back the growth of population; and, in fact, the whole of mankind was being gradually lifted up to a higher level. If only the superior, not the inferior, people increased, he did not think the progress of civilisation would be quite so steady. In conclusion he remarked that, supposing the earth could sustain 5,994,000,000 people, and supposing we were improvident enough to increase at the rate of 8 per cent. each decade, how long would it be until the earth was full? He said that number would be reached in 182 years; and he thought his estimate was very moderate. The earth, if we accommodated ourselves to circumstances and conducted ourselves properly and industriously, would hold even more; but, so far as we ourselves were concerned, he did not think we need make such a tremendous fuss about that, knowing full well we would not live to see the day when there was no more room on this earth.

PROFESSOR ALFRED MARSHALL (President of the Economic Science and Statistical Section) referred to the question of fuel, and said there were many who thought that a check upon population in the future in Temperate regions would come from the scarcity not of food but of fuel; while there were others who said, "Oh, no! a copper wire, of great thickness, right away from the Sahara to England would supply us with all the heat and all the force we shall ever require." In that case, they would see, they went beyond the geographers and required the assistance of the physicists. There was scarcely an aspect of the question of which they knew anything, and when they had found out their facts they would still be troubled with this—supposing they were careful not to over-populate, how were they to be sure that other people would be equally careful not to over-populate the world?

The President (Sir L. Playfair) expressed regret that they had not present any representative of the Imperial British East Africa Company, and read a letter which he had received from Mr. E. J. Maund:—

Mr. Maund stated that his experience in Africa showed that the prevalent idea of Tropical regions being unsuited to colonisation by Anglo-Saxons was quite mistaken. In Matabeleland, Englishmen lived for years, bringing up their children, and keeping their health. Traders, missionaries, and Dutchmen,—all were able to thrive there; and the country was well able to provide the food-supplies for a large population, as farming developments were possible to a great extent.

Sir RAWSON W. RAWSON said that Mr. Ravenstein had submitted to them large and general views which he thought would be profitable to those who could analyse them. No one was more capable than Mr. Ravenstein to give them an estimate of the population. He had said that the question now before them was colonisation; and he had also said that a considerable portion of the unoccupied land-area was Tropical and was not suited to Europeans. He (Sir R. Rawson) believed that the proportion of land in the different zones was as follows:—About fifty per cent. of the whole land was in the Temperate zone, about forty per cent. was in the Torrid zone, and about ten per cent. in the Arctic zone. Before going further, in dealing with a future home for the surplus population of Europe, they must ascertain

the zones that were suited to a European population. It was quite certain that the surplus population of our own country and that of the north of Europe could only occupy a Temperate zone. It was also essential that they should know how much land was available in each of the zones. The Italians, Spaniards, and French had settled in very large numbers in South America, and that was open to others. But what was to become of the surplus populations of China and India? He thought it would be necessary to make some inquiry into the matter, as to how much of each portion of the world was still available for settlement. Regarding France, he could confirm the statement that the native population had made no increase at all. It had been suggested that a request should be made that the council of the British Association appoint a committee for the purpose of investigating the matter; and another suggestion had been that it was a subject well worthy of consideration by the International Statistical Institute, of which he happened to be President. But whilst it was a subject they might well take up, he thought it was one that they (the British Association) would be much more competent to deal with themselves. The English were more interested in the matter than any other nation, and possessed means of procuring information beyond those of any other country. He hoped the result of the paper would be valuable. He believed Mr. Ravenstein's investigation would lead to very useful results for this country and others.

Mr. STEPHEN BOURNE (of the Statistical Society) considered that Mr. Ravenstein's conclusions would dispel the absurd fears often promulgated as to the growth of the world's population. It would be unnecessary to discuss means for checking reproduction of the species. The great duty of the present time was to economise the resources of production. The present habits of acquiring and distributing wealth left room for very great improvement. The resources of the country, for instance, would be greatly enhanced by a reduction in the excessive consumption of alcoholic liquors; and Britain had yet to learn how to utilise her sewage as a fertiliser to the best advantage. Great results, too, might be expected from improved methods of cultivation and extended modes of transit. Tropical regions would be found far less unsuitable to the Saxon if the habits of life prevalent in a Temperate climate were not absurdly insisted upon in the Tropics.

Mr. JOHN MACKENZIE said experience had shown that South Africa was habitable for both the North and South European. He himself had lived within the Tropics for many years, and had seen Englishmen thrive and rear families there. The reason of this was that, north of Cape Colony, a great altitude was attained; and even in the low-lying districts of Mashonaland, where the land was cultivated and well drained, Englishmen could live well.

The REV. DR. CUNNINGHAM pointed out that the intensity of production might be much increased through the direction of Native labour by European intelligence. The ultimate possible total of the world's population was a fact which ought to be well borne in mind; but, in calculating it, it should be remembered that not only food-raising areas must be allowed for, but also areas for the production of necessary raw materials and fuel. The nearer the ultimate limit was approached, the greater attention would be paid to all forms of economy, and the more slowly would the growth of the population proceed.

Mr. WELLS, who had spent many years in Brazil, said that there was an area in the south of Brazil which might be called the Transvaal of South America. To the north-west of Rio lay a considerable coffee-producing region, with an exceedingly healthy climate; and the productive powers of the country were very far indeed from being approximated. Owing to the influx of British capital into Argentina for the construction of railways, a great stream of emigration had set towards that

country of late years, but now that railways were being constructed in all directions in Brazil, the stream of emigration was rapidly turning thither, where a climate and soil far superior to those of Argentina were to be found. It was a curious fact that in South and Central America, as well as in the States, the people all acquired a nasal pronunciation of the language of the parent countries.

Mr. J. B. MARTIN, M.A., could not side altogether with Mr. Bourne and Mr. Ravenstein on the question of emigration. No scheme of emigration would suffice to raise the position of the poorer classes at home. The aim of economists must be to raise the standard of *minimum* comfort in which the population was able to live.

Dr. JAMES BURGESS, of the Archæological Survey of India, spoke of the possibilities of extending production in India and the conditions under which Europeans could live there.

Dr. J. G. GARSON, secretary of the Anthropological Section, said that many people going to Tropical climates endeavoured to live in the same way as in Europe. The same amount of animal food was not needed in the Tropics as in the Temperate zones, and alcohol was less necessary, though it could not be altogether dispensed with. The question of drainage was most important; though it often occurred that the first steps towards sanitation were followed by outbreaks of fever, owing to the saturation of the soil with sewage. Elevation above the sea-level exerted a great influence on health; but the great thing for emigrants was to choose a climate as nearly as possible like that to which they were accustomed.

Dr. FREEMAN, speaking of the West Coast of Africa, said that that region was quite unsuitable for European colonisation. There was a terribly heavy mortality and continual ill health; and no children could possibly be reared in the country.

Mr. JOHN COLES, F.R.A.S., secretary of the Geographical Section, said that too much might be expected of elevated plateaus. British Columbia was considered to have one of the best climates in the world; and yet, a mountain fever very much resembling yellow fever was found there. Irrigation works, too, whatever their benefits, undoubtedly produced malarial fever. It was a mistake to suppose that there was still much land available for colonisation in the Far West or the United States. Most of it was taken up in large tracts by speculators who demanded higher prices than the emigrant could pay.

SURGEON-MAJOR JOHN INCE maintained that there were very few spots available for colonisation by Europeans. He denied that alcohol was necessary in any degree in India.

Mr. RAVENSTEIN, in briefly concluding the discussion, said that he was glad to find himself confirmed in several directions by men of authority. He believed that the idea of Tropical colonisation by Europeans had now been entirely dispelled, though Matabeleland might prove an exception to other Tropical countries.

APPENDIX C.

ABSTRACTS OF PAPERS READ AT THE BRITISH ASSOCIATION MEETING, *Leeds, September 1890.*

New Trade Routes into Persia. By H. F. B. LYNCH.

This paper had as its object an attempt to review the commercial geography of Southern Persia from the standpoint of the writer's experience during recent travels. A twofold consideration at once presented itself: firstly, what was the physical configuration of the country between the Persian Gulf and the Persian

plateau, and, secondly, how could we apply the results of such an inquiry to the benefit of commerce and of civilisation. Here an important element was introduced ; for, given that geography had long ago decided that the present main trade route was about the worst possible, and further, that she had, within recent years, added much positive information regarding better roads, there still remained the important questions, Might commerce enter by them, and, if allowed to enter, would she be starved or fostered ? This was the political element, and he would venture to offer a few remarks regarding it. The chief obstacles to the progress of commerce in Persia lay not only in the indifference of the Persian Government, but also in the apathy of the English people towards Persia and its politics. The English people had the largest interest in the foreign commerce of that Power, which was no distant neighbour of theirs in India ; and, further, the value to them of its political stability was such as to merit not their apathy but their zeal. Stretching from the eastern borders of Turkey to the frontiers of Afghanistan and from the Transcaspian provinces of Russia to the Indian Ocean, Persia covered an area of 610,000 square miles—a territory five times as large as that comprised within the United Kingdom. Of this the greater portion was mountain or springless desert : enough remained of arable, of habitable, and of salubrious districts to equal or exceed the area of our islands. The political importance to us of the development of Persia as an integral state was this : it would be onerous to hold it ourselves, it would be dangerous to let others hold it, it would be advantageous if it could progress—but progress it must—under its present rulers. When the Karun River—a great navigable waterway and the only navigable river of Persia—was thrown open to commerce under certain almost prohibitive conditions, by H.M. the Shah in 1888, the prospect of improved intercourse with Persia was received with some interest by the English press. If certain restrictions could be removed, and if certain facilities were offered, it seemed likely that the new trade routes, the advantages of which our geographers had taken great pains to demonstrate, would descend from the province of theory to that of reality. This hope, in spite of the arduous labours of those who were well acquainted with the methods and habits of the East, had only been partially realised. While H.M. the Shah was being fêted by the merchants of London, the writer himself, as a traveller, was a witness of the scanty help—to say the least—which the Persian Government were extending to London merchants engaged in laborious work on the Karun. Individuals could only point out what measures it was necessary to take to facilitate commerce : our Government alone had the power to see that they were taken. A mere declaration that a river might be navigated was not tantamount to opening it to commerce. In what manner its proper navigation would affect commercial intercourse it was now his object to describe.

After some general remarks regarding the physical geography of Persia as bearing on the subject under consideration, the speaker proceeded to point out that the largest cities and the central points of attraction to commerce by the Persian Gulf were situated on the Persian plateau. Of these Ispahan contained some 80,000 and Teheran some 200,000 inhabitants. The volume of Persian trade flowed from and to the Persian Gulf by means of mule or camel transport ; from the Gulf there was cheap water carriage to India and to Europe. A portion passed by the Black Sea route *via* Trebizond, while the rich province of Khorassan and the shores of the Caspian were enclosed within the widening zone of Russian commercial supremacy. Bushire stood at the entrance of the main avenue of the Gulf trade ; thence a most difficult track led over high and precipitous passes to Shiraz ; from Shiraz the way was easier towards Ispahan and Teheran. The distances along this, the principal road at present, into Persia by the Gulf, were :—

Shiraz, 200 miles ; Ispahan, 520 miles ; Teheran, 800 miles ; and the elevations—between Bushire and Shiraz a pass of 7250 feet ; between Shiraz and Ispahan, one of over 8000 feet ; between Ispahan and Teheran, the Kohrud Pass of 8750 feet. The difficulties along this road were so great that bulky goods destined for Persia were taken by river to Bagdad, and thence, after passing the barriers of a Turkish custom-house, reached the Persian plateau by the easier route *viâ* Kerrind. A glance at the map would show the advantages which Shuster, at the head of the navigable portion of the Karun River, possessed over Bushire. There you had a port distant some 130 miles by land from the Persian port of Mohammerah, to which ocean steamers had access. Shuster commanded a series of routes to the more populous districts and cities of Persia. The chief among these were :—

1. From Shuster *viâ* Khoremabad, Burujird, and Sultanabad to Teheran, a distance of 480 miles, as against 800 between Teheran and Bushire. The elevations along this road were :—For a distance of about 110 miles its profile rose from under 6000 feet to passes over 7000 feet high, the highest being that of Kushkedar, between Sultanabad and Burujird, 7490 feet high. A group of European capitalists were engaged in constructing a cart road along this section.
2. From Shuster *viâ* Malamir to Ispahan, a distance of 250 miles by the road which he had described in the current number of the Royal Geographical Society's Proceedings. The higher altitudes along this road extended for a distance of about 73 miles, and the highest pass along it was about 8650 feet high. By these two roads the distance between Teheran and a port was reduced from 800 miles *viâ* Bushire to 480 miles *viâ* Shuster, while Ispahan held the benefit of 250 as against 520 miles. The first of the two routes from Shuster traversed a country which had been subject to the depredations of the Lur tribes ; but the opening of the Karun River and the revenues derived from increased commerce would make it worth while for the Persian Government to ensure its security. As to the second it lay through the country of the friendly Bakhtiari, who were well within the authority of the Persian Government.

It was now nearly two years since the Karun River had been declared open to navigation as far as Ahwaz, at which point there was a natural dam across the stream. A continuous steam service had, after much negotiation, been organised both above and below Ahwaz. Why was commerce still loth to enter and avail itself of the new trade routes ? This was an important question which those interested in commercial geography would not hesitate to ask. The commerce of Great Britain and India with Persia had been estimated recently by a careful writer at a value of 2,500,000*l.* a year. That figure alone made it seem worth while to attempt an answer. The reasons might be briefly stated thus :—1. The collection of customs was still in a state of disorder ; a settlement had been arrived at nearly a year ago between the British and the Persian Governments by which the customs were to be collected at Shuster, the port of terminus, but this important measure still remained unfulfilled. 2. A postal service on the Karun required to be organised ; this was a matter for our own Government, and its importance had been pointed out by Colonel Bell and Sir R. Murdoch Smith. These were the leading obstacles to commerce as far as Shuster ; once it had penetrated thither it would soon pass further. The development of the short track to Ispahan was well within the power of the Persian Government. The advantages which would accrue to Persia by the use of the new trade routes would be enormous. The benefits to ourselves and to European commerce would not be insignificant. In the past our interest in Persia had been spasmodic ; sometimes we had thought no expenditure too extravagant, at others we had wrapped ourselves in a cold indifference to her fate. Would the new era repeat the uneven history of the old ?

Notes on the Country lying between Lakes Nyassa, Rukwa, and Tanganyika.

By W. KERR CROSS.

This paper describes the Ukonda plains at the north and west of Nyassa, the people, their villages, banana groves, gardens, customs, etc. It also deals with the hill-countries north of these plains.

Journeys in Ashanti and Neighbouring Regions.

By R. AUSTIN FREEMAN, M.R.C.S., etc.

The paper describes a journey through a tract of country in and to the north of Upper Guinea, comprising the territories of Fánti, Assín, Ádánssi, Ashánti, Jáman, and Grúinsi. This tract forms the interior of the Gold Coast. The first four countries are inhabited by various branches of the great Otshwí family, and the remainder by certain pagan aboriginal tribes, and by numbers of Wongára or Mandingo immigrants. Journeying from Cape Coast, through Ashanti to Bontuku, the capital of Jaman, the author crossed three zones of country: (1) open country covered with low bush about 30 miles broad; (2) dense forests about 180 miles broad; (3) open park-like country which, alternating with grassy plains, seems to occupy the greater part of Central and Eastern Africa. On arrival at Kumassi, the capital of Ashanti, the author was received by the king and principal chiefs with great ceremony, the court of Kumassi retaining much of its former splendour. The town of Kumassi is much dilapidated, but presents many relics of great interest. Jaman is a kingdom situated to the N.W. of Ashanti, about 9300 square miles in extent; its capital, Bontuku, is a large town closely resembling in appearance the towns of the Tawarek and upper Niger. It is inhabited almost exclusively by Mohammedans, and forms an important slave depot, as do also the Gruinsi towns of Wà and Bóri.

The commercial resources of the tract of country here described are considerable; over the whole of it gold is fairly plentiful, and the forest abounds in rubber plants both in the form of trees and vines. Hard woods are very plentiful, and are of great value in Europe, notably the Odúm and Pappáo, both of which trees reach a height of nearly 200 feet. The Kola nut also, which grows abundantly in the forest, has a great and increasing commercial value. The country is intersected by several considerable rivers, which might be easily rendered navigable, and thus form great highways of trade. There are, moreover, no special obstacles to the construction of railways, and the district may thus be expected to form one of the great commercial centres of the future.

On Exploration in North-Eastern Cilicia. By J. THEODORE BENT.

After showing how geography, history, and anthropology are interwoven in this district, and the study of one is necessary to the understanding of the other, an account of the Armenian fortress of Sis is given, and the reason for its importance during the Roupenian line of Armenian kings.

The country between Sis and Anazarba is then described, and an account given of the fortress-town of Anazarba and the rivers Jeihan, Sombaz, and Savroon.

Experiences amongst the nomad tribes, and their customs and mode of living are then given, including the Afshars, the Bosdians, and the Circassians, who frequent this portion of the Cilician plains during the winter months.

The country between Anazarba and Kars Bazaar is described, and this place identified with the ancient Flaviopolis.

Exploration of ruins on a spot near the Pyramus, called Bodroun, is then

described, and its identification from epigraphy with the ancient Hieropolis-Castabala.

Inscriptions which show that Artemis Perasia was worshipped here, as Strabo tells us, are referred to to show that this is the Castabala which has hitherto been placed in Cappadocia, and is also the spot which Alexander the Great visited before the battle of Issos.

Notes on Osmanieh and the pass behind it leading into Syria.

From Paraguay to the Pacific. Explorations of M. THOUARS.

By H. GUILLAUME.

M. Thouars made four expeditions in South America. In his first, made under the auspices of the Bolivian Government in 1883, following the disappearance of the Crevaux Mission, he explored the unknown regions through which flows the river Pilcomayo. The second, in 1885, under the auspices of the Argentine Government, was devoted to an overland exploration of the delta of the Pilcomayo lying in the Argentine territory. The third, in 1886, was made in a northerly direction from Rosario to Salta, reascending the Humahuaca and the Cordilleras. The fourth, under the auspices of the Bolivian Government, was made for the purpose of discovering a navigable route eastwards for the commerce and productions of Bolivia.

M. Thouars, by a series of daily observations carefully taken, has obtained the following data:—1. The map, on a large scale, of his journey from Tarija to Asuncion *vid* the Pilcomayo. 2. A general hydrographical map of the river Pilcomayo with its numerous windings, drawn to a scale of $\frac{1}{100000}$. 3. A relief map, measuring 1 mètre 23 centimètres by 1 mètre 17 centimètres on a scale of $\frac{1}{100000}$, containing his four journeys. The Geographical Society of Paris is now completing the publication of these maps.

On the Inhabitants of the Eastern Carpathian Mountains.

By Miss MURIEL DOWIE.

Miss Dowie read a paper dealing with her experiences among the people who inhabit the Carpathian mountains on the Eastern, or Polish, side. She gave a brief description of the life of these people, their work, costume, and character, and included an account of her journeys, alone, on horseback there, the mountains, and the conditions under which she was obliged to live. She concluded with some remarks upon the future of Galicia and its great natural resources in the shape of petroleum wells, salt and silver mines, together with the immense industries in connection with its woods, yet to be fully developed.

GEOGRAPHICAL NOTES.

EUROPE.

Irrigation of Russian Steppes.—An important experiment has been made in the province of the Don Cossacks by a M. Sherebzo. He collected the water from rain and the melting of the snows into two pools, holding together about 1872 million cubic feet, and distributed it among the fields in spring and summer. These pools supplied sufficient water to irrigate more than 2290 acres, but were unable to contain all the water which flowed towards them, and therefore two new