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of Berlin, for their careful examination of the organic remains. The author must be congratulated on the great success which has crowned his labours. His work has demonstrated that Tundra, Steppe, and Forest faunas have succeeded each other, thus establishing the truth of inferences already arrived at by Nehring and others. It has shown, likewise, that this faunal succession followed after the retreat of the great glaciers of the third glacial epoch, and that Palæolithic man was certainly contemporaneous in the Alpine Vorland with the Tundra and the Steppe faunas. Further, it introduces us for the first time to a lost race of Neolithic pygmies. Lastly, we have in the Schweizersbild rock-shelter the most complete section yet discovered, showing the exact succession of the several archæological epochs, the Palæolithic, Neolithic, Bronze, and Iron ages. At the Schweizersbild, probably no long interval supervened between the departure of Palæolithic and the advent of Neolithic man. It is even quite possible that the latter arrived before the last of the reindeer-hunters had vanished from Switzerland. From evidence supplied by certain Pyrenean caves, a similar inference has been drawn. But, even if it should afterwards be ascertained beyond any doubt that Palæolithic and Neolithic man came into contact here and there, it would not follow that this was general throughout Europe. We are now assured that Palæolithic man retreated from the low grounds of our continent along with the gradually retiring sub-arctic Steppe fauna, and that Neolithic man came with the succeeding Forest fauna. It seems very likely, therefore, that Neolithic man may have been in full occupation of Southern Europe while Palæolithic man was still hunting the reindeer in France and Central Europe, and it is quite possible that the two races may have touched along the margins of their respective territories. The evidence of the Pleistocene deposits of Western Europe, however, would seem to show that long before Neolithic man entered those regions, Palæolithic man had taken his departure.

ON THE RELATIVITY OF GEOGRAPHICAL ADVANTAGES.¹

By G. G. CHISHOLM, M.A., B.Sc.

I HAVE to apologise for laying before an association for the advancement of science a number of considerations that are for the most part, if not familiar, at least obvious. There is no novelty in the general proposition I desire to review. The drift of all my remarks is summed up by Professor Cunningham in his "Growth of English Industry and Commerce" in a sentence:² "The economic value of the physical characteristics of a country varies greatly at different times." All that I propose to do is to illustrate that general statement under different heads. Still it may not be altogether useless to do so even in an association for the advancement of science, for there are men with minds acute, penetrating, and subtle,

¹ Paper read at the Liverpool meeting of the British Association, September 1896 (extended).

² *Early and Middle Ages*, p. 12.

able to wind their way into the intricacies of a complex subject with admirable skill, and yet with a curious faculty of overlooking what is immediately before their eyes. Such considerations as I have to lay before you are specially apt to be forgotten in making estimates of past conditions, and still more in framing forecasts of the future.

First of all then, I would point out that the value of geographical advantages varies with the physical condition of the surface of the country. The geography of a country gets altered by the interference of man, and in other ways. That has again and again been emphasised and abundantly exemplified. Still it may be interesting on the present occasion to take Liverpool as an illustration. The importance of the natural feature to which Liverpool owes its origin, the estuary of the Mersey, is so manifest that people have often wondered why it does not seem to have been appreciated by the Romans. The explanation has been offered that this estuary did not exist in Roman, or at least throughout Roman, times, but was due to changes in the coast-line, resulting from earthquakes in that period.

But it was not merely in Roman times that Liverpool was unimportant. It was, as you may learn from your handbook, late in English history before the port was of any consequence. Now, why was this? Because, you will say, Liverpool is on the side of England turned away from the Continent. True, and that is without doubt part of the explanation of the late development of Liverpool, but it is not enough. For on the same side stands Bristol, and this, as is well known, was one of the earliest of English seaports to attain prominence. According to the estimates of population based on the subsidy roll of 1377, Bristol was at that date the third of English towns in respect of population, while Liverpool does not appear in the list at all. In the reign of Henry VII. Bristol ranked fifth among English seaports in respect of customs duties paid then, Liverpool being again absent from the list. But in those times Bristol had decisive advantages which did not belong to Liverpool. Bristol is the port of a region which has always been one of the richest, agriculturally, in England, and one to which population had also been attracted at a very early date by the working of the lead-mines of the Mendips. The physical conditions on the estuary of the Mersey were totally different. On the south side the peninsula of Wirral was a low, boggy flat "anciently," says Camden, "all forest and uncultivated, as the inhabitants relate, but disforested by Edward III.," and described as being, even in his own time (that of Queen Elizabeth), although "thick set with towns on all sides, happier in respect of the sea than the soil, the latter being not fit for corn, but the former very plenteous in fish."¹

The region north of the estuary again was practically cut off from the rest of England, partly by the estuary itself, partly by other physical features. Liverpool was thus dependent for its growth on the resources of its own immediate neighbourhood, and these were not abundant. In this part of the country uncultivable high grounds advance comparatively

¹ *Britannia*, Gough's edition (1789), ii. p. 424.

near to the west coast. North of Bolton the width in Lancashire between the sea-coast and the land above 500 feet is mostly less than ten miles, in places only four or five miles. Moreover, of this width, the area fit for cultivation is still further reduced by the nature of the surface. On the sea-coast both north and south of the Ribble are long stretches of blown sand, to a large extent covered only with coarse grass, and utterly useless for agriculture, driving the villages more or less inland, at Formby point, the westernmost extremity of South Lancashire, about two-and-a-half miles inland. East of that again, in this latter district, there is a narrow strip covered with peat, reaching in places to a depth of 25 feet. Extensive deposits of peat occur also in the Lancashire low grounds elsewhere, as in the celebrated Chat Moss in the south of the county west of Manchester. All such areas could be made fit for cultivation only at great expense, if they could be made so at all, and to these, in considering the likelihood of Lancashire becoming well-peopled at an early date, we must add the relatively infertile soil of the coal-measures. This formation just touches Manchester, and its general southern limit lies a little to the north of that latitude. Westwards the coalfield extends to a mile or two beyond St. Helen's. West and south of this coalfield, accordingly, there is only a small area occupied by the richer soils of the New Red Sandstone periods, unobscured by peat or other later deposits of such a kind as to make the ground practically useless. And even where the soil is sufficiently good, the surface is to a large extent too flat for easy drainage, a drawback all the greater in a part of the country where the climate, in consequence of the situation and physical configuration, is exceptionally moist. One advantage Liverpool had from the first over Bristol. It was more conveniently situated than that port for trade with Ireland, and if Ireland had retained the civilisation it possessed in the sixth and seventh centuries, probably the development of the port of Liverpool and South Lancashire generally would have proceeded more rapidly than it did. As things were, the port of Liverpool did not begin to develop till after the causes that made Manchester a great centre of manufacturing industry, and inland trade had begun to operate, and hence had made South Lancashire a centre of attraction for transmarine, and even trans-oceanic commerce.¹

Secondly, it may be pointed out that the value of geographical advantages varies with the political condition of the country to which they belong, as well as that of other countries, and, thirdly, with the state of military science.

These two heads may be illustrated by the difference in the situation of the Roman walls in Britain and that of the Anglo-Scottish boundary. The Roman walls both ran in a nearly straight line across comparatively narrow tracts of country and through fertile lowlands. Their whole purpose was to mark off and render easily defensible a frontier against barbarians. It was important therefore that the frontier should not be

¹ The nature of the causes referred to is considered in a paper which I have prepared for the *Geographical Journal* ("On the Distribution of Towns and Villages in England," Pt. II.), but which is not yet published.

unnecessarily long, and in those times that it should run through a country from which it was easy to draw supplies. These conditions were fulfilled in both the situations where the Roman walls or ramparts were erected.

The strength of the situation of the more important of the two walls, that of Hadrian, which formed the limit of Roman dominion in Britain for between two and three centuries, was already pointed out by Camden, who adds that its weakest point was discerned by the Caledonian invaders who ultimately broke through it. "It is worthy of observation," he writes, "that as the Roman prudence raised this wall in such a manner that it had within it, like a second defence, two large rivers, the Tine and the Irthing, which are but a very little way asunder; so the cunning of the barbarians first opened their principal inlet between these two rivers where they had free entrance into this province without the obstruction of any river."¹ The traditional point of this irruption is at Thirlwall, which at least from the time of Fordun is said to owe its name (from the Anglo-Saxon *thirlian*, to penetrate) to this circumstance. "Whatever truth there may be in this etymology," says Mr. Bruce, "it is certain that this is the weakest part of the wall."²

But when England and Scotland came to be divided, two more or less civilised powers had grown up with different centres. The centre for England was towards the south, all the more absolutely so since the ruthless harrying of the only populous region in the north, that between the Humber and the Tees, by William the Conqueror. The centre for Scotland was on the borders of the Firth of Forth, round which the bulk of the population was necessarily settled. If these two powers were to effect a final breach, it was natural that that breach should take place where the cohesion was least, or in other words where the population was least dense, and was by the nature of the surface ever bound to be so. The section across the Cheviots from the Solway to the Tweed is just that line. Petermann's map showing the distribution of population in that region in 1851, might have served almost equally well so far as the shading is concerned to represent the distribution of population in that region at any previous period after the establishment of the kingdom of Scotland, except that in earlier times a much lighter shade would have represented the basin of the Clyde. Hence it was as natural that the two kingdoms, if they were to break off at all, should break away at that line, as that an hour-glass when any transverse strain was applied should break in the middle. The boundary between England and Scotland is similar to that between Spain and Portugal, along the line of scanty population marking off on the west the more fertile and populous tracts on the lower Tagus and the lower Douro. East and west of the sheep-pastures of the Cheviots the tract of arable land between these hills and the sea is very scanty, and in the east the border is marked by a river broad enough to serve as a good line of defence. On the west the tract of arable lowlands between the Cheviots and the

¹ Camden's *Britannia*, Gough's edition, 1789, iii. p. 214.

² *Handbook to the Roman Wall*, 4th edition, 1895, p. 189.

Solway is even of less extent, and to make their frontier more easy of defence the English here secured for themselves the bog known as Solway Moss above the head of the Solway between the Esk and the Sark.

The natural character of this boundary, the degree to which it was determined by geographical conditions in accordance with the circumstances of the time, is shown by the manner in which it came to be established. There is no record of any formal agreement on the subject. Boundary commissioners were appointed for the purpose of adjusting the marches early in the thirteenth century, but this seems to have led to no definite result. The boundary was regarded as settled by usage.¹ This, however, does not apply to the then important town of Berwick-on-Tweed. It remained long in dispute between the two countries, and not till 1482 was it finally ceded to England.

But while it was quite natural that the boundary between England and Scotland should come to be drawn just where it was, it does not follow that it was absolutely certain from geographical conditions that any boundary should be drawn at all. It must be remembered that the kingdom of Northumbria stretched quite naturally from the Forth to the Humber. Why, therefore, should the kingdom of England not have reached to the Forth also?

In answer to this question two views are possible. In the first place, we must note that before the Norman conquest the relation of the territory between the Tweed and the Forth to England had been altered by a historical event. In 1018 the battle of Carham wrested that territory from Northumbria, so that at the time of the conquest it was not regarded as subject to the English crown. If it had been so regarded at that time, it may be conjectured, from the character of the Conqueror, that he would have been resolute in keeping it in subjection, and if he had succeeded in doing so it is not improbable that the whole of Britain would very speedily have been made one kingdom.

On the other hand, it must be remembered that it was easier for a kingdom with a capital on the Ouse than for one that necessarily had its capital far in the south to retain under its sway a population so distant and isolated as that in the basin of the Forth. It may be doubted whether the military organisation of the time was equal to such a task. Resolute as William was, it is clear that he fully appreciated the difficulties of the smaller enterprise that he had entered on. Otherwise he would not have thought it necessary to give such a severe lesson to the rebels of the north. A disposition to wanton cruelty was no part of his character, and it may be surmised that the devastation of the northern counties was prompted, not merely by the desire to strike terror, but to remove the danger of a dense and prosperous population so far from the centre of his power.

Fourthly, the value of geographical advantages depends upon the state of applied science. This also is a commonplace and need not detain us long. It is abundantly illustrated in the history of British

¹ Burton's *History of Scotland*, edition 1876, ii. p. 10.

industry, more particularly in the iron and textile branches. Notwithstanding the wealth of Great Britain both in coal and iron ore, it was only comparatively late in our history that we ceased to look to foreign countries for large quantities of our iron wares and pig-iron. Till about the middle of the eighteenth century the use of coal for the smelting of iron was practised only as a trade secret, and only gradually did its use become commoner after that. The presence of extensive woods for the supply of charcoal was looked upon as necessary for this industry, and hence the districts in which it flourished were richly wooded tracts like the Weald, the forest of Dean, and the western midlands. In the eighteenth century the smelting of iron ore for the supply of British ironworks was considered (at home) a very proper industry for the plantations on the eastern seaboard of North America, but the manufacturing of that iron a highly improper one. The first extensive ironworks in Scotland were set up (as late as 1754) amidst the forests on the sides of Loch Etive for the smelting of ore brought from England.

Down to the close of the eighteenth century the development of our textile industries depended solely on our wealth in the great raw material, wool, and the advantages of our commercial position. The marvellously rapid growth of our textile industries may be dated from the year of the erection of the first mill employing steam-power (1785, at Papplewick, near Nottingham). It was then that our coalfields began to be turned to account in a manner hitherto not dreamt of.

The precise nature of the influence here referred to is also worth noticing. When cheap power was thus added to an unrivalled commercial situation, the double advantage told, and still tells, most in the case of those commodities in which the cheapness of mechanical processes and of distribution are of most importance in determining the final cost of the article. While, therefore, British manufactures maintain a high if not the highest pitch of excellence in all branches, it is in the production of the cheaper wares that find a wide market all over the globe that this country is absolutely dominant. Even in textile industries this country has keen and in some cases victorious competitors abroad in the finer kinds of goods, those in which skill, care, and taste count for more than they do in the cheaper goods of world-wide consumption. These finer and higher-priced goods are better able to bear higher charges for transport, and even to fight against the disadvantage of lack of coal at the place of their production. The great bulk of English woollens are made in Yorkshire, but some of the finer classes of woollen goods are still able to maintain their ancient seats in the west of England. In spite of our coalfields, and in spite of our enormous home and colonial trade in raw wool, France has always been able to supply us with enormous quantities of woollen goods of high quality. In a recent consular report attention has been drawn with some surprise, and as usual some reproof, to the fact that Switzerland exports to this country about four times as much as she derives from it. To those who derive all their information as to British trade from our own blue-books the fact here mentioned may well be surprising, for the practice of referring all goods imported or exported to the country from which, or to

which they are shipped, conceals the fact that we carry on any trade with Switzerland at all. But to those who keep their eyes open, there are plenty of indications that we do carry on a large trade with that country, and when we consider the circumstances it is not really surprising that the imports and exports should bear to one another the ratio that they do. On the contrary, some such proportion may be said to be the direct result of geographical conditions. Without a seaboard and without coal Switzerland under modern conditions of industry might be looked upon as being at a hopeless disadvantage in the struggle for a place in the great markets of the world. And if Switzerland had been slothful and backward, and had not believed in education, the struggle might have been hopeless. If she was to maintain such a place for herself, it could only be by widely diffused skill in the production of commodities for which a comparatively high price could be paid. It is in that way that she has raised herself to industrial eminence. For such goods a wealthy country like England naturally forms one of the best markets. On the other hand, Switzerland is by no means a natural market for many of the characteristic and dominant products of British industry, and there are other countries much better situated than this for supplying Switzerland with such commodities as she does import.

It is little more than a hundred years since the application of inventions to the utilisation of our coalfields began to work such a tremendous change in the economic position of this country. So rapidly has the consumption of coal in consequence increased that it is natural that apprehensions should have long ago been excited in view of the ultimate exhaustion of those coalfields. But it has also to be borne in mind that the value of our geographical position, so far as it depends on coal, is also liable to be affected by other circumstances than the exhaustion of our own coalfields. It obviously becomes relatively less with the opening of coalfields elsewhere; but perhaps a still more important consideration is that advances in the electrical transmission of power derived from falling water may greatly modify the relative advantage of the possession of coal- and water-power.

Fifthly, the value of geographical conditions varies with the density of population. A certain density, not always a high density, of population is required to utilise other geographical advantages. Of this two illustrations may be given.

Professor Thorold Rogers, in discussing the failure or alleged failure of the repeated attempts of English kings to improve the English textile industry, attributes that failure, in his usual dogmatic and decided manner, "to the unparalleled backwardness of the English intelligence."¹ Whether there is or was that "unparalleled backwardness" I cannot say, but it does not seem to me that any such assumption is necessary to account for the facts. When we hear of a textile industry, such as the manufacture of linens or woollens, being introduced from abroad, we are not to understand that such industries were not previously practised at all in England. It is to be taken for granted that linen and woollen

¹ *Economic Interpretation of History*, p. 376.

garments of some kind were made throughout the country from the Roman period downwards; but the fabrics of home manufacture were only coarse stuffs made for local use in the agricultural villages. The textile manufactures introduced from abroad were those of the finer fabrics, or, as Adam Smith puts it, manufactures for distant sale. Now, such manufactures require, in order to thrive, a considerable market, and the larger the market the more flourishing and the more highly developed are they likely to become. But the home market of England was a small one. Throughout the middle ages the population was scanty. A foreign market was therefore needed to give the necessary stimulus to the development of native manufactures. Not only that, but in order that commerce might stimulate manufactures, it was necessary that the industrial products of England should be able to compete in some way, whether in respect of quality or cheapness, with those produced elsewhere, and it was long before this condition was fulfilled. The foreign commerce of England, as was necessarily the case with a thinly peopled country on the outskirts of civilisation, was long confined to the export of raw produce in exchange for luxuries and the products of a more highly developed industry. This accounts for the fact that we read of the same industry being introduced more than once from abroad, or being developed by the settlement of foreign artisans; for even when improved manufactures were once introduced, they were apt, in consequence of the inadequate market, to languish, or at least not to keep pace with the growth of those industries in countries more favourably situated. And of all countries few were more favourably situated in the middle ages and the early modern period than Flanders and Holland, with their seaports communicating with all the world, and their magnificent navigable rivers reaching into populous regions of France and Germany; and their vicinity to England made it natural and almost inevitable that from them she should derive repeated stimuli to the growth of her own industry.

That example may serve to show the necessity for a tolerably dense population to turn to account geographical advantages. The next illustration is intended to show that in certain cases or from certain points of view a sparse population may be an advantage. If we consider external commerce as a matter of great importance, and inquire into the relative advantages of different regions for supplying distant markets with agricultural produce, then we find generally that it is the sparsely peopled parts of the world that supply the bulk of such exports. Next to the United States, among all countries for which we have statistical information, France is that which produces most wheat. But France is not a wheat-exporting country. The great wheat-exporting regions of the world are such sparsely peopled tracts as Dakota, Minnesota, and Manitoba, California, Oregon, and Washington, Cordoba, and Santa Fé. An enormously greater quantity of rice is produced in Bengal than in Burma, but it is from Burma we import it.

This, of course, is looking at a geographical advantage from a very special point of view, and it may be urged that the agricultural advantages of the regions mentioned might be even more fully turned to

account if they were applied to the support of a much denser local population, and less of the produce were left for export to distant countries. That is quite true, but it is none the less true that where a population is dependent wholly or mainly on agriculture, its density may be increased to such a pitch that all the advantages of the region disappear, unless we are to consider the mere maintenance of a vast number of people a matter greatly to be desired, in whatever state of poverty and misery the bulk of those people may exist.

The last consideration that I have to bring before you in connection with my subject is one of great importance, one that has to be taken into account to a large extent in estimating the value of geographical conditions. In the abstract of my paper I have used the expression "mental attitude" to sum up what I have in view under this head. But that summary epithet requires interpretation. It must be understood in a large sense. What I wish to include under it is anything in the ideas of a people as to government, economics, religion, or the organisation of society that has an important effect on the habits of the people.

The importance of some of these considerations does not need to be enforced. As to government, for example, it is obvious that hardly anything can be of more importance in determining the economic value of the geographical conditions of that country than the consideration whether the ruling powers do or do not make it their aim to measure out the same justice to all classes and religions. I say "make it their aim," because I am here leaving out of account any blunders of policy that may be made in carrying out that aim. Few, I should think, in this country can doubt that if such were the aim of government in Turkey, the geographical advantages of that empire would be at once enormously increased. If it were conceivable that such a change were wrought in the Turkish government, or that that government could be superseded, with the goodwill of all other countries, by some other government which made that its aim, there are parts of the Turkish Empire that are probably capable of a development, or rather revival, as rapid and extensive as any we have seen in the present century.

In our own time we have had a demonstration on a large scale of the importance of the consideration now engaging our attention by a change almost as marvellous and quite as unexpected. The case I refer to is that of Japan. Here for centuries an ancient civilisation utterly unlike that of the West resolutely kept itself as isolated as possible as regards western influences. Suddenly there was a revolution in the government, accompanied by a change in the mental attitude of the governing powers. So sudden was the change that the likelihood of its being permanent was scoffed at. And yet the scoffers have proved wrong. With deliberate forethought and perseverance Japan has entered on the path of progress as understood in Europe and the countries of European origin. She has sought for European teachers, but only to teach and introduce, with no idea of remaining for ever dependent on European tutelage. She has shown herself an apt learner, and able to dispense with European assistance in almost all branches with a celerity that has surprised every one. She has thoroughly adopted the scientific

spirit—the disposition to weigh, to count, and to measure, and to be governed in one's conclusions by the results of such observations. The result has been the rapid expansion witnessed in the last thirty years, an expansion affecting all branches of industry. Japan has found herself in the position that England was in during last century and part of the present, when manufactures, commerce, and agriculture could all grow hand in hand. Formerly this change was looked upon as an unmixed benefit to the manufacturing countries of Europe, and the only fear expressed was that it would not last. Now there is no such fear, but many are rendered anxious by the opposite dread, that the expansion may proceed to such an extent that this new rival may cut us out in all markets.

There is another eastern country in which a change in the mental attitude of the people might bring about results even more prodigious. The country I mean is China, the resources of which are very imperfectly developed under the present system, and appear to be very little known in Europe. "China," says Richthofen, "is naturally the most blest of all the countries of the earth, the home of a third part of the human race, the seat of a peculiar highly developed civilisation, and apparently inexhaustible wealth in products of the soil and intelligent human labour, a land with an inexpressibly great and important future, whose gigantic trade will become more and more the subject of rivalry among civilised nations."¹ Elsewhere² I have given from the same authority an account of one part of the hardly utilised wealth of China in the form of a field of the most excellent coal, not merely unparalleled but unapproached in magnitude and facility of working in any part of the known world.

What prevents these enormous resources from being turned to account by modern methods is mainly the mental attitude of the Chinese, and not merely the attitude of the government, not merely the feeling of jealousy and distrust entertained towards Europeans and their ways, and the desire to exclude so far as possible European influences, but an excessive spirit of conservatism spread through the people in consequence of the exaggerated feelings of reverence for their fathers and forefathers inculcated on them through countless generations. The feeling that what was good enough for our fathers is good enough for us is, of course, common everywhere among the ignorant and sluggish-minded, but in China that idea is fostered even among the educated and intelligent. It seems to strengthen other motives, such as self-interest and dread, which are in some cases hostile to change.

It may be that the geographical conditions that have helped to determine the course of Chinese history explain also to some extent the prevalence of this mental attitude. The Chinese entered from the north on a land cut off in a remarkable degree from all other parts of the earth, but affording great room for expansion and development within its natural confines. This development went on accordingly to a large extent uninfluenced by foreign competition, whether economic or political. It was therefore able to proceed by slow degrees, involving no observable

¹ *China*, i. 729.

² *Journal of the Statistical Society*, vol. liii. pp. 584-6.

changes on ancient methods. It was unaffected by such powerful stimuli as naturally result when a people are suddenly brought face to face with new conditions. Such intercourse as was maintained with distant countries at different times mainly influenced the seaboard, and owing to the vast extent of the country could not be far-reaching in its effects. Even European influence, since it was first introduced by the Portuguese, has not penetrated far, and it must be confessed that from the first there has been much in the way in which that influence was introduced to prevent the Chinese, both as a government and as a people, from according it a welcome.

Still it is impossible to believe that the present mental attitude of the Chinese towards Europeans and their methods will be permanent. It seems to me that there are two influences constantly increasing in force tending to overcome that attitude. One is political, the other economic. The political influence is the constant advance of Russia on the north, awakening the Government to the fact that railways, however repugnant to their wishes their introduction may be, are necessary as a means of defence. This influence, as we all know, has already had its effect, although apparently too late, and hence in such a manner as rather to favour than hinder the extension of Russian ascendancy.

The economic influence arises from the fact that the foreign commerce of China, though relatively small, is not without its importance, and the Chinese are finding it more and more difficult to maintain that commerce against the competition of other countries that have shown more readiness to adopt European inventions. The competition of Japan in silk seems likely to prove as serious as that of India has already become in the case of tea.

But whatever might be the immediate cause it has long been foreseen that such changes as we are now considering were in the long-run inevitable. "Although," said Sir Rutherford Alcock at a meeting of the Royal Geographical Society, "none now present might live to see it, he had no doubt that the Grand Canal would ultimately be repaired, the Yellow River would be confined within its proper limits, railroads would extend from the north to the south, coal and iron mines would be worked, and cotton mills would be established to supply their own wants without sending to Lancashire."¹ Already this anticipation is partly fulfilled, but how soon we may expect its complete fulfilment we are still unable to calculate. With respect to this question there are several considerations to be borne in mind. First there are many indications that, conservative as the Chinese are, they are not so averse to novelties when once introduced as their general habit of mind would lead one to suppose. On the same occasion as that just referred to Sir R. Alcock said that "the Chinese were very slow to move, but when they were thoroughly convinced, it was astonishing with what perseverance and tenacity they kept on the course which they considered the best for their own interests." When the first railway was laid in China, that from Shanghai to Wusung, there was no lack of passengers to ensure

¹ *Proceedings of Royal Geographical Society*, 1880, p. 165.

its financial success, and only official hostility led to its being taken up. Now that the telegraph has been extended with official approval and for government purposes to the remotest parts of the empire, the people have availed themselves of the advantages thus afforded with great readiness. "The telegraph in Yünnan," says a recent traveller, "is very largely used by the Chinese, especially by the bankers and officials. By telegraph you can remit, as I have said, through the Chinese banks, telegraphic transfers to the value of thousands of taels in single transactions."¹

But further, there is this geographical circumstance to be considered as likely to accelerate the spread of European influences. Once an important railway is in operation in China, affecting directly a large tract of country, then the present economic equilibrium is disturbed. Other parts of China will find that they are placed at a disadvantage, and one after another will begin to clamour for what they had previously no desire for, even if they were not hostile to its introduction.

What the ultimate results of the introduction of European methods of production and transport throughout China will be it is scarcely possible to forecast. That the effects of opening up a coalfield such as I have referred to above, of connecting it by rail with the Chinese plain and its seaports, could not fail to be vast is certain, but what the precise nature of those effects would be is not so clear. But that question it is not our business to determine. We leave it to the economists. With reference to it, however, we may point out one or two considerations that belong at least in part to geography. If vast industrial communities came thereby to be created in or near the Chinese coalfields, their existence would involve a large import of agricultural commodities into those districts. This could not arise without raising the price of such commodities at least in a great part of China, and that would indirectly tend to raise other prices, which would have an important effect on the relations of China with the rest of the world. Further, the fear has been expressed that when China, with its enormous advantages in labour and natural resources, does come to be opened up, European industry will be wholly paralysed, and every European market will be flooded with the products of an industry against which it is impossible to compete. But with regard to that fear it may not be superfluous to point out that the Chinese will not under any circumstances flood any market whatever with any commodities unless they get directly or indirectly something in exchange for them. They have so much human nature in them that in the way of business they will, like the English, Dutch, Germans, or Americans, give nothing for nothing. Hence any flooding of our markets with Chinese products can take place only on condition that the Chinese take some of the products of our industry in return. What commodities we should be able to supply under the conditions we are supposing it remains to be seen. It is conceivable, though perhaps no more than conceivable, that the advantages in China for the production of all ordinary commodities might be so great that none of these could

¹ *An Australian in China*, by G. E. Morrison. London, 1895, p. 166.

be sent by us in exchange for Chinese produce. But in that case China would at least take from us the precious metals. In other words, prices in China would be rapidly levelled up, and China would then be compelled and glad to take commodities of another kind. Whatever the precise outcome may be, we may feel certain that the development of Chinese resources by modern European methods could not fail to stimulate in some way or other the industries of other parts of the world than China. It might and probably would bring about a great dislocation in the present distribution of industry, but it could not bring about stagnation.

Lastly, it may be pointed out that the effects we are now contemplating are the results of the distribution of the natural resources and population of China, and would be experienced in some form or other, whatever might be the political fortunes of the country.

PROCEEDINGS OF THE ROYAL SCOTTISH GEOGRAPHICAL SOCIETY.

CONGRESS OF ORIENTALISTS.

DR. JAMES BURGESS, LL.D., C.I.E., F.R.S.E., has been appointed to represent the Society at the Eleventh Session of the International Congress of Orientalists, to be held at Paris from 5th to 12th September 1897.

GEOGRAPHICAL NOTES.

By ANDREW J. HERBERTSON, F.R.S.E., F.R.G.S.

EUROPE.

The Growth of Hamburg.—The development of German industry in recent years is vividly illustrated by the rapid development of its chief port Hamburg, as shown by the figures recently quoted in *Le tour du monde* (7th August 1897). In 1882 the number of vessels entering the port from the sea was 6189, a tonnage of 3,030,990; in 1889 the figures were 8079 ships or 4,809,892 tons, and, in 1895, 9443 ships or 6,812,394 tons—52 per cent. more vessels and 125 per cent. greater tonnage in 1895 than 1882. The river port has grown in importance also, the number of vessels increasing from 9380 in 1882 to 12,385 in 1889 and 14,135 in 1895, and the tonnage from 1,435,443 in 1882 to 2,349,527 in 1889 and 3,076,421 in 1895. The traffic is now so great that new docks are to be made.

The Greek Islands in the Ægean.—Everything Dr. Alfred Philippson writes about Greece is of interest and value to geographers, and we accordingly take the following notes from his recent communication to the Berlin Geographical Society, on the Isles of Greece in the Ægean, based on a journey made last year, in which, unfortunately, no Turkish islands were visited except Samothrace.

Physical Structure and Features.—The Ægean sea, with its innumerable islands, is the uniter rather than the separator of the Balkan and Asia Minor peninsulas. Not