

of the schools. There were every year one or two courses of lectures on physical geography. One of the favourite subjects in the Cambridge University Extension scheme was physical geography; and there were 7000 students scattered over the kingdom in connection with the University scheme, a very large number of whom had at some time or other gone through a course of physical geography. The tendency was for men to specialise earlier and earlier. All the geography which could be taught in common as bearing upon history or ethnology or physiography must be taught in the schools, and the special parts of each would be taught at the Universities in different departments. He entirely supported the movement inaugurated by the Royal Geographical Society.

Mr. LANGLER (Westminster Training College) said that the discussion had been on the teaching of the advanced subjects of geography and in connection with advanced schools, but Mr. Ravenstein had dwelt on the subject as affecting the general population of the country. If the great masses of the people were properly instructed in the geography—not the mere topography—of other countries, especially of the British Colonies, the idea of emigration might be popularised. Only the more intelligent of the labouring population were generally those who went abroad; the most ignorant did not, and it would be a great national advantage if the Society would help to diffuse a knowledge of geography amongst the lower classes. That subject was indeed extensively studied in the public elementary schools; problems which affected great circle sailing, or projections, were not necessary for the majority of the pupils in those schools, and he thought that the Society would do well to make popular in magazines and periodicals the ideas embodied in Mr. Ravenstein's lecture and in Mr. Keltie's Report. Could not the medals, or some other reward of a substantial or attractive character be conferred upon the young teachers in elementary schools, so as to encourage among them the study of geography, and thus lead them to give better, or more suitable instruction to their scholars? Such awards could be made, for instance, to candidates at the annual examination for admission to Training Colleges, if the Society could secure the co-operation of the Education Department. Or some other plan might be independently adopted to stimulate the profitable study of this subject which, with our overcrowded population, should be one of increasing interest and importance.

Mr. FRANCIS GALTON thought that a contrivance might be introduced into schools similar to one he had seen in the upper galleries of the Geological Museum in Jermyn Street. A small globe was placed there to represent the sun, and in the opposite gallery, at a distance of 93 feet, under a glass shade, there were hung two small balls to represent the earth and the moon. The whole were made true to scale. The sun was consequently but a few inches in diameter, and the earth was no larger than a large pin's head; the moon being of course still smaller. These two little balls were about three inches apart. A simple fixture of this kind would give to the scholars revelations as to the relative magnitudes and distances of the bodies of the solar system, and they might very easily be fitted up in any school.

The CHAIRMAN said the date of the Exhibition was fixed with reference to the approaching vacation at Board Schools, so that teachers from all parts of the country might examine the appliances. The impression had become pretty general that the value set upon proficiency in any particular subject by the Universities gave it a certain stamp in the educational system of the country; but when it was considered how very small a proportion of the population ever reached the Universities, it would be seen that no effort should be neglected to have a proper system of teaching geography in all schools. From the Report of the Royal Commission on the Great Public Schools, it appeared that only seven per cent. of the scholars at Harrow went on to the Universities. If that was true of a school like Harrow, what must be

the proportion in the rest of the country? Attempts were now being made to form an educational ladder by which children from elementary schools might be able to reach the Universities, and it was therefore certain that the teaching at the Universities must always exercise a considerable influence in other schools; but he quite agreed that it was most important to encourage the teaching of geography at elementary schools. At the present moment he believed that geography was infinitely better taught at the best elementary schools than at the great public schools, with the exception of two or three. He was sure the meeting would heartily thank Mr. Ravenstein for his admirable address, which showed such a thorough mastery of the subject, and such an appreciation of its difficulties; and he congratulated both the audience and the lecturer on the discussion which had taken place. It was a very hopeful first meeting, and he trusted that it would be succeeded by others which would display a growing interest in the subject. The object of the Exhibition was to promote the study of geography, and as he had been President of the Society when Mr. Keltie was sent to the Continent to make the inquiries which had terminated in the Exhibition, he should be disappointed if all the trouble that had been taken was barren of results.

Mr. RAVENSTEIN, after cordially thanking the meeting, said he found that children after two years' instruction in *Heimatskunde* were perfectly able to understand that the earth was a globe, and the meaning of latitude and longitude. Mr. Swinstead's efforts to create a system of teaching geography were most creditable to him, but the method was first introduced fifty years ago by Lohse and Agren, and had been practised with much success. It was, however, a complicated system, and it would be easier to make children remember the degree lines on a map than to learn the ingenious dodges which Mr. Swinstead had introduced.

LECTURE II. December 22nd, 1885.—Mr. FRANCIS GALTON, F.R.S.,
Vice-President, in the Chair.

On Geographical Appliances. By J. SCOTT KELTIE.

Before the lecture,

The CHAIRMAN said, that a fortnight ago, when the Exhibition was first opened, the President of the Society, the Marquis of Lorne, had stated the circumstances under which it had been called into existence, and the reasons why the Geographical Society had undertaken its superintendence. A week ago, at the second meeting, a most instructive, full, and luminous paper had been read by Mr. Ravenstein, and he (the Chairman) felt sure that all who had heard that excellent address must have gone away conscious of a valuable addition having been made to their geographical knowledge. The meeting held that day was the third of the proposed series, and the subject for the usual lecture was that of geographical appliances, such as those distributed about the rooms, and it was due to the zeal and energy of the lecturer—Mr. Keltie—that visitors were now able to inspect specimens of every kind of geographical appliance in the form of maps, reliefs, and globes, that existed either in England or abroad. Some were simple and gave only a general idea of the subjects with which they were connected, while others entered more into detail. With regard to the maps, some were cheaply got up in the first instance, and others were more expensive; and in this connection he would say that to him it appeared that the original cost of a good design for a map, as distinguished from the cost of reproduction, need be no bar to its being undertaken, because, considering the hundreds of thousands of children to be educated, there must always be a

demand for a really good map. He might mention that the Geographical Society had actually offered to help to defray the cost of particular maps if those directly connected with education could agree precisely on what they required. There were two or three appliances necessary in geographical education which hardly came within the limits of the Exhibition but which still deserved mention. He was very strongly convinced of the necessity of devising some simple forms of laboratory experiments which could be performed before a class, and show the principal processes going on in physical geography. Then there were magic-lantern slides, which formed a very suitable apparatus for effectively bringing home to the conceptions the physical features of the earth. True it was that such appliances appealed only to the sense of sight, but there were other influences capable of imparting geographical knowledge besides the faculty of seeing. One strong instance of this would be found in the case of a very eminent statesman, who blind though he was, delighted above all things to be taken to some elevated point of view and to have the features of the surrounding country described to him. By the duration of ascent he gained an idea of the altitude, and many other incidents of the journey, such as the freshness of the air, the smells, the sounds, and the silence too, all combined to impress his imagination with the geography of the district. Poetical and verbal descriptions of nature, in virtue of the many subtle associations connected with words, were also able to produce extremely vivid effects; and it was a misfortune that some of our greatest poets had possessed but a very meagre acquaintance with geography. That almost inspired man, Shakespeare, was evidently deficient in this respect, as witness his description of the sea, given in "The Tempest," which was absolutely false in every particular. Many of his descriptions of confined areas, such as the Midland Counties, were exceedingly appropriate, but there were no references to the larger aspects of nature. Perhaps our own Poet Laureate was most successful in geographical description. He (the Chairman) would not enter further into detail on the power of happy phrases in awakening the geographical imagination, but would call at once upon Mr. Keltie to read his paper.

Mr. Keltie, in his lecture, after indicating what ought to be the object of geographical education, pointed out that the appliances used ought to be of use in effecting this object. He then showed the value of taking the pupils outside the school as much as practicable, and teaching at least local geography and elementary physical geography in the open air. As to maps, the principal appliances in geographical education, he pointed out the importance of teaching the pupil to bring out of them all the information they are intended to convey. A list of the apparatus to be found (1) in the geographical class of a German university, (2) in a German high school, (3) in a German elementary school. English maps were then compared with foreign maps in respect of general appearance, accuracy, execution, and suitability for their purposes. Methods of representing physical features were dwelt on, and it was maintained that most of our school maps are too small. In the matter of classical maps, in which we ought to be especially strong, it was shown by examples that we are much behind the Germans, Kiepert's classical maps being generally found in English public schools. Models and relief maps Mr. Keltie valued chiefly as a help to the understanding of ordinary maps. Ideal landscapes he deprecates. In the same way globes and atlases were passed in review, and the value of geographical pictures insisted on. As to telluria, the simpler they are the better, and means should be taken to correct the erroneous notions they are apt to convey. As to text-books, those in use in England are as a rule too large, and too full of bald names to be committed to memory. In conclusion, were there a demand for high-class work in geographical appliances in this country, there is no doubt publishers would be found to meet it.

After the lecture,

Dr. J. H. GLADSTONE said he thought they ought to express their thanks to Mr. Keltie for the admirable way in which he had brought the subject of geographical appliances under their notice. He (Dr. Gladstone) was glad to find he approved of the endeavours of the London School Board to give the children a proper idea of the meaning of a map. The Board had also put into use in their schools some of the very best appliances from the Continent as well as those produced at home, and now very rapid progress in the teaching of geography was being made. He thought a little more credit was due to the recent changes in the Government Code than perhaps the lecturer had given to them. In most of the schools the list of names hitherto required to be learnt by the pupils was not now necessary, which was most satisfactory, inasmuch as they only served to clog their memory to the exclusion of many useful thoughts. Where there was no list of names required it was sometimes usual to insist upon the committing to memory of detailed outlines. Of course memory lessons were valuable, but intelligence ought to be brought into the study of geography, and the memory might come in afterwards. He rather approved of the Government policy in directing that the geography taught should be physical, and not merely political. There was an admirable sentence in the instructions issued to Her Majesty's Inspectors, to the effect that teachers were not expected to impart simply the names of different towns and places on a map, but to give, in addition, some description of historical events, or the productions and manufactures peculiar to them. He trusted that in future more attention would be paid to the teaching of physical geography, and that the processes of building up continents and deepening seas would be made familiar to the inmates of the schools all over the country. Only the previous day he had seen the thing done in one of the poorest schools in London. Nothing had been said in the lecture about the outline maps now published, or Suzanne's globe. This latter was of a dark hue, the aqueous portions being coloured blue. Chalk was used in drawing upon it, which could be readily cleansed off when required. The instrument was very much in use in French schools, and had been introduced experimentally into those of London. He trusted that the various methods of teaching geography recommended by the Royal Geographical Society and other bodies would lead to a more extensive acquaintance with it on the part of the people at large, and its acquirement might be connected more closely with the pursuit of physics and natural science. Among the recommendations lately issued by the Royal Commission upon Technical Education was one that there should be only two class subjects, literature and science, "science" being physical science connected with geography, such as a knowledge of the various conditions of the ocean, air, &c., and of the various products of the earth. He hoped that in the process of time that recommendation would be put into actual practice.

Rev. EDWARD HALE (Eton College) said he wished to join in thanking Mr. Keltie for his information regarding the methods of teaching geography on the Continent. He also thought that all teachers owed a debt of gratitude to the Royal Geographical Society, which was doing everything in its power to promote the study of geography, hitherto so much neglected. He was certain that the teaching of physical geography must be the foundation of any teaching of science, and it was upon those lines that it was taught at Eton, with which he was connected. One of the great difficulties that teachers had to contend with was the uniform size of the maps of all countries. Much that it was expected boys should learn was gained by the use of their eyes, and though there was a scale at the bottom of each map, yet it did not mean much in the sight of the young. What was really wanted was that an outline of Great Britain on the same scale as the map should accompany each map. It was also difficult to convey a proper idea of form without being furnished

with the necessary reliefs, and the supply of these in the higher schools was often miserably inadequate. Indeed, in some of the very best schools in England there would not be found so complete a collection of appliances for teaching geography as was possessed by many of the Board Schools. With regard to the use of models as aids to instructing boys as to the form of various bodies, he was inclined to look upon photographs as the more effective medium. As to physical geography, there was hardly a school in England in which it was taught to any extent or with any success; the reason being that the time of the scholars was so cut up by the various other studies, and the time at the disposal of the masters was so limited, that the teaching of geography in anything like a scientific way was, under present circumstances, almost impossible. In fact, it did not pay to teach it. He hoped it would not be long before the Universities would recognise that the teaching of history without geography was a complete farce, as then teachers might be led to give a proper course of geographical lessons. The blame for this apathy with regard to geography did not rest entirely with the schoolmasters, but with the Civil Service Examiners of the present day, whose examination papers only tested the competitors in their knowledge of the position on the map of a number of plans—a test of memory only. As all the candidates for the Army are examined by the Civil Service Examiners, it follows that our officers, generally speaking, know less of geography than the officers of other European Armies. In some way or other he trusted that this state of things would soon be remedied, but he did not think it would be done unless public opinion was brought strongly to bear upon the examiners.

General Sir BEAUCHAMP WALKER said he entirely agreed with Mr. Hale regarding the inadequate teaching of geography in the schools of the country. For six and a half years he had been Director-General of Military Education, and every effort he made to encourage geography as a vital military subject was thwarted by indifference. The real opposition, however, did not come from the military authorities, but was to be traced to the obstinate prejudice existing in England against the study of geography, especially among the wealthy and influential classes. The reason why maps were so dear here, as compared with the prices charged on the Continent, was that the demand for them was so small that publishers could not afford to circulate them at a less cost, though, given a quick sale, they could produce them as cheaply and as artistically as was done abroad.

Prof. H. N. MOSELEY said he thought the real reason why geography was so neglected in our schools was summed up in the words of Mr. Hale, who had observed that it did not pay to teach it. To give it an impetus, the study should be taken up in the Universities, and at this moment the question was arising at Oxford whether geography should not be ranked as one of the alternative subjects of a preliminary examination which would qualify for entrance on the study of science and certain other special branches of knowledge, and to some extent stand in lieu of moderations. He believed in the learning by heart of a certain amount of the leading features of the topography of the globe, as a framework to aid in the comprehension and retention of the very various and complicated phenomena with which the science of geography had to deal. If marks were given at schools for excellency in drawing maps from memory, instead of for mere proficiency in tracing them from atlases, the results obtained would be far more valuable. The correct insertion of the main features of latitude and longitude should be insisted on in such maps. The knowledge of the main topographical features of the map of the world might with advantage be acquired by every child as a matter of memory, as was the multiplication-table. It would be as fundamentally useful to the child in building up a knowledge of geography, as is the multiplication-table in acquiring a proficiency in arithmetic and mathematics.

Mr. DREW (Eton College) said he thought it would be a difficult thing to carry out Mr. Keltie's suggestion of setting the children to sketch out upon the floor of the school the physical aspects of their district, as to do that forms and desks would have to be removed. The gradual building up of a map on the blackboard, instead of exhibiting it only in its complete form, was an admirable practice. As to the excursions to the Surrey Hills and elsewhere, and some other means mentioned by Mr. Keltie for teaching physical geography, he thought that they could only be taken advantage of by select scholars, and were not capable of being extended to the large numbers in Board schools or even to ordinary Public schools. There was a good deal of force in the lecturer's opinion that the scholar should advance from the known to the unknown, but if that plan was adhered to strictly he did not know how many years a boy would have to remain at school before he became acquainted with, for example, Turkey or Russia. He was sorry to see in some of the maps in the room—especially that of Italy—that the depths of the tints were made exactly in accordance with the heights, thus showing a departure on the part of map-makers from the custom of making the depths to correspond with the steepness of the slope. In the Blue Book on India there was a most beautiful, delicate, and yet effective map of the mountains and rivers of India. He thought there might be two sets of maps and diagrams in use, one to set forth boldly the prominent features of a country, and capable of being easily seen from a distance, the other to give more detail and on a smaller scale, placed so as to be accessible to the pupils. The instruments on view, for affording an idea of the relative distances from each other of the earth, sun, and moon, were of the greatest value, especially that fitted with the screen, as it was a very good method of teaching what was very difficult to convey—the persistence of the axis of rotation and the changing direction of the plane which divided the light from the dark. He hoped that the Royal Geographical Society would not relax its efforts to make geography popular, and it deserved the thanks of all interested in the science for having sent Mr. Keltie upon the expedition the result of which had been just placed before the public. He suggested, in conclusion, that the Society should get constructed in the best style a model of the British Islands and exhibit it permanently in their rooms.

Mr. FRESHFIELD said, since other speakers had congratulated Mr. Keltie on the success of this Exhibition, he felt inclined by way of variation to congratulate the Chairman, for he might fairly say that what had been done had been accomplished to a very great extent through Mr. Galton's persistent and skilful endeavours in keeping the subject of geographical education before the attention of the Society. With regard to relief maps, his belief was that they would not be of much use except in cases where the best works of this kind could be bought and found room for. He did not attach much value to the smaller relief maps used in the Italian and some of the German schools. Their exaggeration was a very serious objection. He thought relief maps would be found most useful, not in giving the picture of any particular locality or country, but as affording typical representations of the plastic features of the earth's surface. At the same time, such a relief map of Italy as that lately published, would be of great assistance to students of history as well as of geography. Had there been such a map in existence when he was at Eton, he might have learnt as a boy many facts since slowly acquired during twenty years' peregrinations. He wished to encourage publishers to produce maps showing the physical features of a country to the same extent and in the same way as relief maps did, for use in primary schools. In his opinion political boundaries should be kept as much as possible off all but specially political maps, for the confusion they caused was one of the greatest hindrances to accurate knowledge. He would like to see every primary school with good maps of the British colonies and a map of the world showing the relative positions of the colonies,

the routes to them, and the time occupied in the voyage. Fear of the unknown was one of the great difficulties encountered in efforts for the better distribution of our population throughout the empire. Illustrations in geographical teaching were hardly done justice to in the Exhibition, and his contention was that photographs of mountains, cañons, sea-coasts, &c., should be used as the material for a thoroughly scientific and artistic series of 'Geographical Illustrations.' In many cases, a view of an actual locality might serve as a type—e.g. Mont Blanc, the Aletsch Glacier, Etna—and he recommended that, where possible, such real views should be selected as more interesting to the student.

REPORT OF THE EVENING MEETINGS, SESSION 1885-6.

Fourth Meeting, 18th January, 1886.—The Most Hon. the Marquis of LORNE, K.T., President, in the Chair.

ELECTIONS.—*Walter Baring, Esq.; John Allan Cunninghame, Esq.; Major Alexander M. Delavoye; William Purdham Goulding, Esq.; Ludovico W. Hart, Esq.; Lucas White King, Esq.; Alexander Macnab, Esq.; Senhor J. A. da Cunha Moraes; John Richardson, Esq.; Alfred Strutt, Esq.; Edward George Stubbs, Esq.; Philip F. Walker, Esq.; E. Calvin Williams, Esq.; Robert Williams, Esq.*

The paper read was:—

"The Hill Slopes of Tonking." By J. George Scott. Will be published with map and discussion in a subsequent number.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—December 4th, 1885: M. ALPH. MILNE-EDWARDS in the Chair.—The Minister of Public Instruction presented to the Society some of the papers which were in the possession of the late M. Huber at the time of his assassination in Arabia. M. H. Chatelain presented a curvimeter, made by his father. By means of this instrument, it is possible to obtain instantly and with great accuracy the measurement of distances on geographical maps and plans without reference to the scale. It makes no difference whether the distances are represented by straight, curved, or broken lines. A letter was read from M. A. Vallon, late Governor of Senegal, and a member of the Society, stating that a map of Guadeloupe, signed E. Devèze (1874), had by chance just come under his notice. This map, to his surprise, he found to be an almost exact reproduction of the map prepared by himself in 1863, a copy of which was in the possession of the Society. The General Secretary said that this letter raised the question, so many times discussed by the Society, of the infringement of copyright as regards maps, and suggested that the Society should take some further steps with regard to the subject.—A communication was read from M. Hangsen-Blangsted regarding the island of Christiansö near the eastern coast of Bornholm, in the Baltic Sea. According to him there is no island of this name in existence, the name having originally been given to fortresses built upon a group of three islands situated about 12½ miles off the east coast of Bornholm. The correct name of this group of small islands

is Ertholmene.—M. M. Venukoff sent some information regarding geographical progress in Russia. The Geographical Society of Russia had just published the numerical results of the levelling of the ground in Siberia from the foot of the Ural Mountains to Lake Baikal, from which it appears that the altitude of the lake is 1540 feet. The same Society had awarded a gold medal to M. Pevtsoff for his explorations in Dzungaria, Mongolia, and the Kirghiz steppes. M. Martin had completed his journey in Siberia, and M. Venukoff forwarded a map of the traveller's routes, giving many new topographical details of the country between the Lena and Amur.—M. R. du Caillaud transmitted two communications, one with regard to the fortress of Tam Giang or Thanh-Mai (Tongking) recently captured from the Black Flags by General Jamont, and the other concerning the Christians in Annam. The latter have been attacked by some of the natives and have, although badly armed, made a good resistance and completely defeated the enemy.—A letter was read from M. Ant. d'Abbadie, of the Institute, dated 27th November, from Abbadia (near Hendaye) enclosing two communications he had received from Major Serpa Pinto. These letters were then read by the General Secretary, the second being dated 26th October, 1885, from Zanzibar. M. Roma du Bocage, Plenipotentiary of Portugal at the Conference for the Delimitation of Guinea, made some explanatory observations with regard to these communications and the object of M. Serpa Pinto's mission, which he said was to explore and study the region separating Lake Nyassa from that portion of the eastern coast occupied by the Portuguese colony.—The Minister for Foreign Affairs forwarded a despatch from M. Mancini, French Consul at Asuncion, regarding the new journey of M. Thouar up the Pilcomayo, who had started from Asuncion on 28th September. A copy of a short letter from M. Thouar was enclosed.—Captain Sörensen forwarded a map of Spitzbergen, with corrections made by him from the results obtained during his last voyage, together with a table of meteorological observations.—M. Lucien N. B. Wyse presented on behalf of the author, M. Manuel Uribe Angel, an accomplished native of Colombia, a work entitled 'Geografia general y compendio historico del Estado de Antioquia.' This book was stated to be important as giving an exhaustive description of the physical geography of this little-known State.—M. Levasseur presented a pamphlet by M. Bouley on emigration from Europe, and also laid on the table M. Coudreau's book giving an account of his journey in South America.

December 18th, 1885: M. FERDINAND DE LESSEPS, President, in the Chair.—M. Maunoir read his report on the operations of the Society and the progress of geography during the year 1885. Having alluded to the losses the Society had sustained by death during the course of the year, the Secretary said the Society might congratulate itself on the increase in its collections of books, maps, and photographs. He then referred to the excellent services rendered by Mr. Charles Aubry, who had been the agent of the Society for thirty years, and stated that the Central Commission had asked the Minister of Public Instruction to recognise the services rendered by M. Aubry to the Society. M. F. de Lesseps then conferred upon M. Aubry academical honours, which, he said, were only a just acknowledgment of his services. M. Aubry, who was loudly cheered, briefly returned thanks for the distinction conferred upon him by the Minister of Public Instruction at the instance of the Society. The Secretary then continued his report, reviewing the principal journeys accomplished during the year. (The report will be published as usual in the Quarterly Bulletin.)—In conclusion, M. de Lesseps said a few words on his recent visit to Rheims, where he had inaugurated the new Geographical Committee which had been formed in the Industrial Society of that city.