

encountered several hot-springs, but unfortunately took no record of the temperature, nor indicated their location exactly, as a guide to future travellers desirous of making precise scientific observations.

The oft-discussed question of the geological causation of that remarkable wrinkling of the surface of south-east Tibet into a series of parallel valleys, through which the great rivers rush southwards, is not advanced nearer to a solution by the vague theories indulged in in the last chapter. These hypotheses, which are not even new, are not based on examination of the actual rocks, and are uninformed by the many facts collected by the experts of the Indian Geological Survey and others. The great river of Central

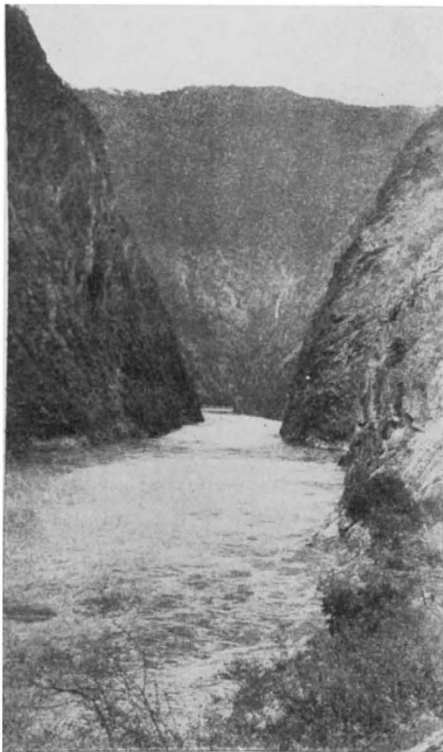


FIG. 3.—The Salween in the arid region, below La-Kor-ah. From "The Land of the Blue Poppy."

Tibet is not usually spelt "Bramapootra" nowadays. Notwithstanding its scientific deficiencies as "the journal of a naturalist," the book gives a lively popular account of adventurous travel off the beaten tracks, and the numerous photographs convey a good idea of the country traversed.

THE OCCURRENCE OF OIL SHALE AMONG THE JURASSIC ROCKS OF RAASAY AND SKYE.¹

THE Geological Survey of Great Britain in the course of their investigations in the Isle of Skye have discovered an oil-shale which may ultimately prove of economic importance, and as

¹ Communicated by the Director of the Geological Survey of Great Britain.

notices of the discovery have appeared in the daily Press, it is desirable that the facts so far as they are known to the Geological Survey should be placed on record without further delay. The discovery was made by Dr. G. W. Lee, who has written the following account:—

The stratigraphical position of the shale is at the very base of the Great Estuarine Series, a group which succeeded strata containing a fauna of Garantiana age (high in the Inferior Oolite),

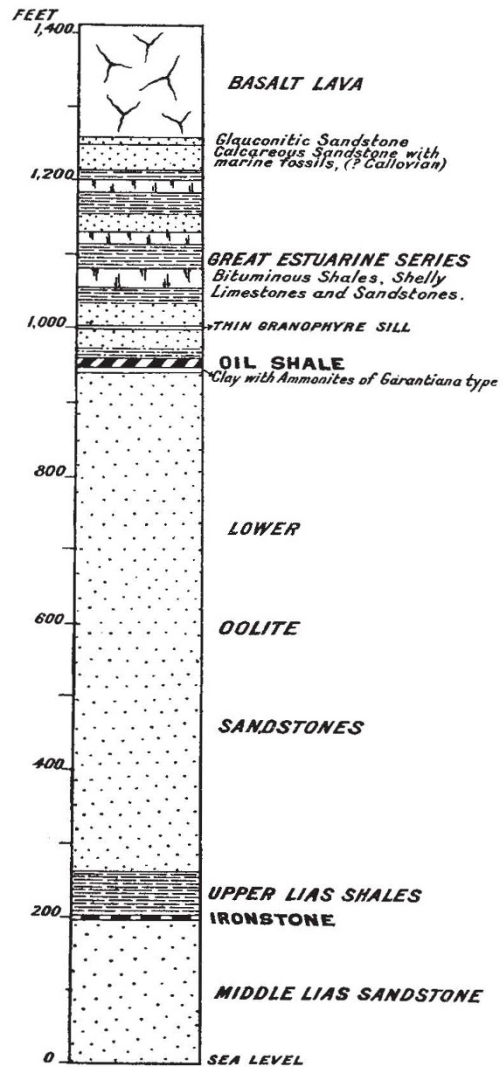


Diagram section illustrating the sequence of the Jurassic rocks below Din Caan, Isle of Raasay.

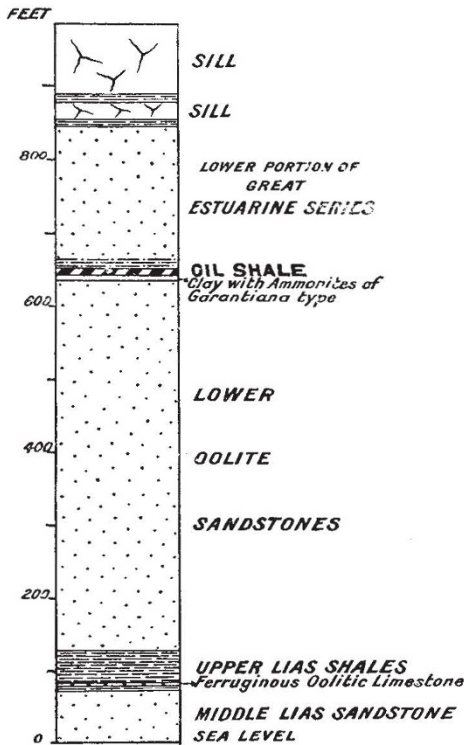
and is overlain by Kellaways Rock. The shale itself yields fossils. They include Entomostraca, a flattened lamellibranch, and plant remains. Since it rests immediately on the marine Garantiana clay, it follows that the incoming of estuarine conditions must have been a sudden one.

The shale is brownish in colour, fine in grain, gives a wooden sound under the hammer, and has a brown streak. It is tough and resists disintegration by weathering, a character which

distinguishes it from the bituminous shales found throughout the Estuarine Series, all of which crumble into small fragments. It is so far known only from natural exposures, where through weathering, it assumes a lilac or yellowish coating.

The thickness of the seam at the outcrops may be taken to be from seven to ten feet, but its passage into the overlying sediments is gradual.

The samples so far analysed were much weathered, so that we are not yet in possession of exact data concerning the yield of oil and by-products from the fresh shale. That the fresh shale might be expected to yield more than weathered portions seems probable, but to what



Diagrammatic section illustrating the sequence of the Jurassic rocks in the cliff between Holm and Prince Charles's Cave, Isle of Skye.

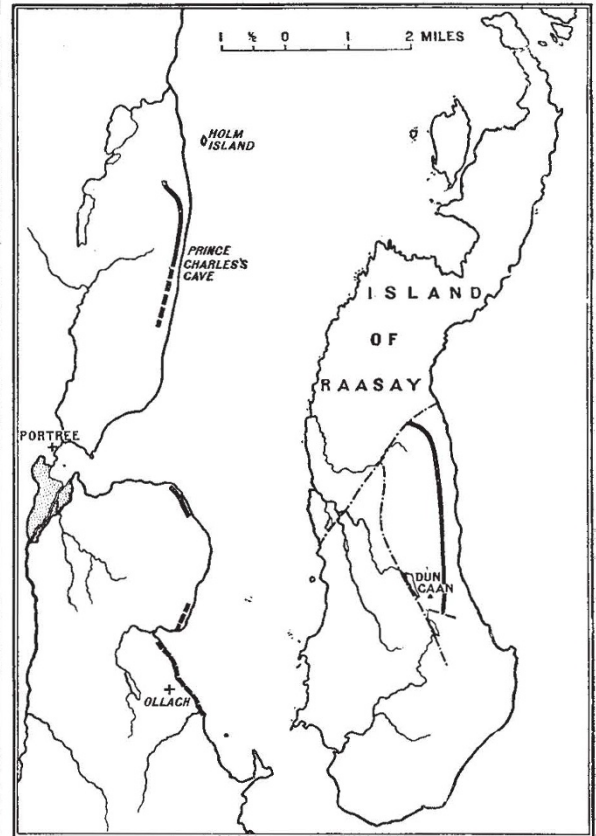
extent is not known, and it is on that that the industrial possibilities of the find depend.

A sample from the outcrop where the shale was first detected in Raasay gave 12 gallons of crude oil per ton of shale, with 6.2 lbs. of sulphate of ammonia, which is equivalent to at least 12 lbs. in a works retort.

A compound sample from the Skye coast between Holm and Prince Charles' Cave yielded 12.8 gallons of crude oil per ton, and 7.4 lbs. of sulphate of ammonia. Mr. D. R. Steuart, who kindly undertook these tests, states that the samples were so weathered that he did not expect to get any oil. Consequently these results indicate that the shale is worth further investigation.

Before the period of denudation which removed so much of the Scottish Jurassic rocks, the shale probably extended over a large area. Still, the portions that escaped denudation are not inconsiderable. In Raasay the field occupies an oblong area stretching from Dun Caan northwards to the boundary fault which throws the Mesozoic rocks against the Torridonian. It is three miles long, with an average width of seven-eighths of a mile, which diminishes southwards. The strata are not folded, but have a dip of about 10 degrees to the west.

In the Portree district of Skye there was once



Sketch map showing the outcrops of the Oil Shale.

- Oil Shale.
- - - Oil Shale, where burnt by contact action of igneous rocks.
- · - · - Faults.

an extensive field, of which much has been destroyed by the contact action of intrusive rocks. The crop has been traced from Ollach—five miles south of Portree—to the Holm burn—five miles north of Portree. The outcrop south of Portree shows much alteration from heat, except between the Tom cave and the Clach Dubh. North of Portree the destructive action of the intrusions is felt as far as Prince Charles' cave, but between that point and the Holm burn—one and a half miles further north—the shale has escaped the action of igneous rocks. There is no inland exposure of the oil shale horizon, which is everywhere covered by higher beds; consequently the

probable extent of the field towards the west cannot be estimated. But the dip being low the shale would be within practicable reach for some distance inland. In the cliff section between Berreraig and Upper Tote, that is north of the point just considered, the shale facies is replaced by a sandstone facies.

THE ADDRESSES AT THE MEDICAL SCHOOLS.

THE first of October is the opening day of the winter session of our medical schools; and in many of them it is made the occasion of an address, given by some person of high authority. The addresses this year include a wide range of subjects. Mr. Handley, at the Middlesex Hospital, gave a very pleasant discourse on the "renegades of medicine," the men who have forsaken medicine for some other profession, not without advantage to themselves and us—Keats, Goldsmith, Bridges, Huxley, Livingstone, and many more. It is a new subject, and worth working out; but we are not sure that Mr. Handley got hold of the right end of the moral. Sir William Osler at St. George's, Dr. Hunter at Charing Cross, and Prof. Sherrington at Leeds, spoke on certain problems of medical education. Sir John McFadyean, at the Royal Veterinary College, spoke on the working of the new Tuberculosis Order of the Board of Agriculture. He stated that the number of milking or dairy herds in England and Scotland free from tuberculosis was practically negligible; and he urgently advised the owners of valuable pedigree herds, as a matter of their own profit, to eradicate the disease among their animals. He also advised that contagious abortion in cows, and Johnes's disease, should be brought under the Contagious Diseases of Animals Act.

Two of the October addresses this year are of especial interest—one, at the London School of Medicine for Women, by Sir Charles Lukis, Director-General of the Indian Medical Service; the other, at St. Mary's, by Sir John Hewett, sometime Lieut.-Governor of the United Provinces. These two addresses, by men of profound experience and unquestioned authority, should be read carefully by all who want to know what the medical profession is accomplishing, and what it hopes to accomplish, for the peoples of India.

Sir Charles Lukis, speaking to women students, appealed to them for personal service. His appeal, full of wisdom and of sympathy, ought not to fail: for the work done in India by medical women is some of the very best work in the world. He spoke, especially, of the imperative need of more teaching and more acceptance of ordinary rules of sanitation, not only for the prevention of the spread of malaria, plague, and tuberculosis, but for the prevention of food-infection, and water-infection. It is our medical women who alone can get the women of India to help in this good work. "Ladies who have spent all their lives in England are apt to regard their Indian sisters as being very downtrodden

and oppressed. This is a grave mistake. Out of doors the man is lord of creation, but once he is inside the house he is absolutely controlled by his wife and mother in all matters concerning domestic economy and the family life. Indeed, I know of no country where the woman is more absolutely the mistress of the house than she is in India; and I am convinced that we shall never make any real headway in promoting the knowledge of domestic and personal hygiene until we have convinced the women of India as to its necessity, and they have thrown their powerful influence into the scale. Here the medical man is useless—the *pardah* bars the way, and it is to the medical woman that we must look." Sir Charles Lukis went on to speak of infant mortality in India, and of its relation to early marriage, and to the native methods of midwifery. Then he described fully the improved scheme for a women's medical service for India, and the plan for a medical college for women to be established in Delhi. Every word of his address is worth reading.

So is every word of Sir John Hewett's address on the work of the medical profession in India. He spoke first of the improved health in the Army, and in the jail population. "The mortality among the wives of soldiers has been reduced to one-third of what it formerly was, and that among their children to one-half." The death-rate among the native troops has come down from more than 20 per thousand in 1871-1880 to less than 7 per thousand in 1911. The death-rate among the jail population has come down from 71 per thousand in 1831-1856 to 18 or 19 per thousand in 1911. Sir John Hewett then spoke, with strong feeling, of the errors of anti-vaccination and anti-vivisection. Truly, in view of the facts of India, they are worse than errors. "It is surely calamitous that the opponents of vaccination in England should have set themselves to make the people of India hostile to a process which has brought them so much benefit." To the anti-vivisectionist, we commend Sir John Hewett's statement of the results of the protective treatment against plague, typhoid, and hydrophobia in India. These results are not only a final verdict against anti-vivisection; they are a magnificent record of the saving of the lives of men, women, and children.

SCOTTISH ORNITHOLOGY IN 1912.¹

THIS report supplies in an epitomised form the results of the activities of Scottish ornithologists during the past year. It is a comprehensive and well-arranged booklet of ninety-six pages, and is both useful and important, since it affords much information hitherto unpublished, as well as a *résumé* of all that has appeared in serial literature during the period covered. A pleasing feature is to be found in the fact that these well-known lady ornithologists have themselves contributed materially to the year's opera-

¹ Report on Scottish Ornithology in 1912, including Migration. By Leonora Jeffrey Rintoul and Evelyn V. Baxter, hon. members of the British Ornithologists' Union. (Edinburgh: Oliver and Boyd; London: Gurney and Jackson. Price 1s 6d. net.