

crystallized mineral species, was not to be confounded with the mineral belt of Hochstetter, often referred to in the Geological Reports, and which was characterized by the abundance of magnesian impregnations of the rock, and the occurrence of the ores of copper and chrome. This belt extended, but not continuously, from Nelson to the West Coast north of Milford Sound, whereas the tin-bearing rocks were in relation to granite-masses. He fully expected that the intersections of the system would yield valuable minerals. Discovery might be hastened by accident; and most probably the development of this form of the mineral wealth of the colony would be slow, and depend largely on the practical skill that is employed in the search. To find a white quartz in a blue slate was an easy matter, but to detect and trace mineral lodes required special training.

Mr. Marchant asked if the granite which occurred near the Owen and Wangapeka was the same as the tin-bearing granite of Stewart Island.

Sir James Hector, in reply, said that there were several distinct forms of granite. He did not consider that the granite east of Mount Owen was the same as that north of Reefton, where tin had been found: it was probably of much later date. The Separation Point granite was again different.

4. "On the Occurrence of Fluor-spar at the Bâton Gold-fields," by J. Park, F.G.S.

ABSTRACT.

In this paper the author describes a large deposit of fluor-spar recently discovered at the Bâton. Mr. A. Thomson, who discovered the mineral, took it for scheelite; but Mr. Skey proved it to be fluoate of lime. The main outcrop of this interesting mineral is situated on the north face of Thomson's Hill, about half a mile from the saddle on the road from the Bâton to the Wangapeka. It occurs close to the point of contact between the crystalline limestone and granite, and measures from 30ft. to 35ft. in width, and from 50ft. to 60ft. in length, forming a rocky spur running parallel with the outcrop of the limestone and associated mica-schist and hornblende-gneiss. Following up a small stream falling into McRae's Creek, a branch of the Wangapeka, the fluor-spar can be traced by loose blocks on the surface a further distance of 20 chains. It is also abundant at the limestone caves near the source of this stream, being there associated with masses of barytes, hæmatite, and quartz-crystals. The main mass of the fluorite is granular, but it also occurs crystalline. Its colour is generally white and pale-green. This is the first discovery of this mineral in New Zealand; but, apart from the scientific interest attached to this, its occurrence has an important bearing upon the probable mineral resources of this district. Fluor-spar is constantly associated with lead and tin in all parts of Europe and America, and in the north of England it forms the gangue of the lead-veins intersecting the carboniferous strata. During the past two years a number of small veins of argentiferous galena have been found at the Owen and Wangapeka goldfields, and, judging from the presence of the fluorite, Mr. Park considers there is a strong probability that the veins found at the Bâton would be of a workable and permanent character, and for this reason he urges that the line of outcrop, the limestone caves, and, in fact, the whole of Thomson's Hill, should be thoroughly prospected for ore-deposits. At the same time, samples of all the minerals associated with the fluorite should be tested for lead, silver, and tin, and other precious minerals usually accompanying that mineral. Fluor-spar is a valuable flux for the reduction of refractory ores, and has been used for this purpose from the earliest times. It is also used for the manufacture of hydrofluoric acid, and as a glaze for pottery.

Sir James Hector considered the presence of fluete of lime a valuable indication that the agencies which had produced deposits of metallic ores had been in operation in the locality. Everything was tending to prove the correctness of the surmise he had frequently ventured, that the north-west district of Nelson would prove one of the richest mineral districts in New Zealand.

THIRD MEETING: 31st July, 1889.

Mr. A. de B. Brandon, President, in the chair.

New Member.—S. Percy Smith, F.R.G.S.

Papers.—1. "On the Soaring of the Hawk—A possible Reason for Notched Wing-feathers," by T. W. Kirk, F.R.M.S. (*Transactions*, p. 325.)

Sir J. Hector said he considered Mr. Kirk's observations to be of great interest. The question of how the soaring flight of birds was mechanically maintained had long been a subject of discussion, and there were several interesting papers in the "Transactions of the New Zealand Institute" dealing with it. He had always held that the investigation should be founded on the anatomy of the birds. Many years ago, with Sir W. Buller, he had made dissections of the muscular attachments of the wing of the albatros, and at the time thought he had found evidence of the existence of tendinous expansions from the brachial muscles that could exercise a rotating influence on the quill-feathers, after the elbow and wrist-joints were locked in full extension. The extended arm of the wing would then act as a sustaining parachute, while a slight "feathering" movement of the primaries, acting with the leverage at a distance from the centre of gravity of the bird, would exercise a great influence in controlling its direction of flight. Specimens of the albatros preserved in spirit had been sent Home, and submitted by Sir W. Buller to competent authorities, however, and this view had not been sustained. So far as he was aware, the mechanical effect of the interlocking of the primaries, rendered possible by their peculiar emarginations, as described by Mr. Kirk's paper, was certainly a novelty.

The Hon. R. Pharazyn called attention to a series of pictures in the *Illustrated London News*, taken from instantaneous photographs, showing the rotary motion of the wing-feathers of birds in flight. He stated that the motion varied in different parts of the wing, and he believed it quite possible that in some species the peculiar motion mentioned by the author did take place.

Mr. Kirk, in reply, said he did not enter upon the question of the supposed rotary motion of the wing-coverts at all. And the amount of rotary motion required in the primaries, supposing his idea to be correct, was very small—merely sufficient to allow the feathers to lock in the manner indicated. He was aware that the structure of the terminal joint would seem to preclude the possibility of a rotary motion of the primaries; but he believed that careful observations in the field and laboratory, aided by experiments, would yet prove that it was possible for the bird to alter the position of these feathers at will.

2. Further Evidence *re* the Korotangi, or Stone Bird. (*Transactions*, p. 499.)

Mr. Tregear said that he had no paper to read on the subject, but that he had received some documents bearing on the question, and would make some remarks thereon. He would first recall the main points of