## JULY, 1901.

The monthly meeting of the society was held at Hobart on Tuesday, July 30th, the Bishop of Tasmania presiding. There was a good attendance.

Three new members were elected—Dr. P. C. Boyd, Mr. Russell, E. Macnaghten, B.A., and Mr. Henry J. Wise.

Apologies for inability to attend from the president of the society, Sir John Dodds, from the senior vice-president, Sir James Agnew, and from the Hon. N. J. Brown, were received.

Mr. Alex. Morton, in the absence of Mr. W. F. Petterd said that that gentleman had prepared two papers of interest They would be printed for the use of members. The first of these papers was on the "Microscopic Structure of Some Tasmanian Rocks." It described some aberrant members of the basalt family, which, although not common in Tasmania, are occasionally met with. Tachylyte was a glassy form of basalt, originating from the rapid cooling of the magma by contact with a cooler substance. It was commonly found in thin layers, but sometimes is met with, as at Bothwell, in comparatively large lumps. It also occurs at Fernhill, near Deddington, and, in a lesser quantity, at Burnie. Limburgite (from the Burnie-Waratah railway) was a dense, hard, and extremely tough rock, so much so that it became notorious during the construction of the Burnie and Waratah railway. It is dark, almost black in colour, and very fine grained in texture. Basalt-vitrophyre (from Sheffield was microscopically one of the most attractive rocks in Tasmania. It was usually intensely black, extremely brittle, and easily reduced to fragments. Hydrated olivine basalt (Native Point, Perth) was a rock of abnormal physical character, invariably heavy from the absorbed moisture, and soft to a degree. It fractures on exposure to atmospheric action. It closely resembles palagonite, and was obtained in sinking holes in the locality mentioned.

Mr. Petterd's other paper was on some land shells from Maria Island, Tasmania.

### Coal Discovery at Wynyard.

Mr. R. M. Johnston, Government Statistician, read the following note on the Wynyard discovery:—

"I had read with much interest of the discovery of coal on the north-western part of Tasmania, near Wynyard, a few weeks ago. Hitherto the existence of members belonging either to the mesozoic or upper coal measures, or to the permo-carbon or lower coal measures, of Tasmania, was unknown to geologists, in all that region of the North-West Coast lying between the Mersey Coal Basin and Cape Grim. A few days ago, I was fortunate in receiving from Mr. Victor West, of Wynyard, a specimen of the bituminous shale associated with the newly-discovered coal seam exposed on the Inglis River, about 16 miles south of Wynyard. Fortunately, Mr. West selected a piece of the shale bearing a clear impression of a portion of the frond of a fossil fern. The typical plant remains of this period are two species of a genus of the Coniferæ (Noggerathopsis); characteristic net-veined ferns of the Genera, Gangamopteris and Glossopteris; and lycopods of the Genera Tasmanites and Schizoneura. The following are the localities where the lower coal measures were known hitherto to occur in Tasmania, viz., Mersey, Tippagory Range, Tamar, Mount Pelion, Henty River, Fingal, Ben Lomond, Harefield, Adventure Bay, and Mount Cygnet. As a rule, when coal seams occur in these lower coal measures, they are found to be purer, more bituminous, and freer from ash than the cool seams of misozoicage? They are, therefore, better adapted for steam purposes and for the production of gas, than the coal seams of the later age, which alone hitherto have been worked to any extent in Tasmania. It is to be hoped that the discovery at Wynyard may turn out to be a good working seam, or seams. If so, it will be of untold value to the district of Wynyard, as well as to the colony generally. Mr. West has kindly promised to give me further particulars regarding the general geology of this district at an early date, which I shall be pleased to communicate to the fellows of this society."

Replying to questions, Mr. Johnston said he had not sufficient particulars yet to say whether the seam or seams were of sufficient size for favourable working.

Mr. T. Stephens said that at a meeting of the society in 1869, he exhibited a pebble of hard and compact kerosene shale, found with many others near the mouth of the River Inglis, and expressed the opinion that portions of the carboniferous series from which it had come, though removed by denudition near the coast line, would one day be found at no great distance inland. This shale is practically identical with the so-called "cannel coal," discovered a few years ago near Barn Bluff.

## Astronomical Observations at Capetown Observatory.

Mr. Kingsmill began by referring to the kindness of Sir David Gill, the Government Astronomer at Capetown, who gave him opportunities of seeing the work of his observatory, and made him a present of some beautiful photographic slides, showing some of the most remarkable results. These slides were supplemented by others obtained from the Royal Astronomical Society. The lecturer first gave a description of the Capetown Observatory. It is an Imperial institution, provided for and controlled by the Admiralty, and it is liberally endowed for astronomical research, having a staff of 30 observers. It resembles a village, having a number of buildinges for the instruments, and for the observers' residences. The site chosen was as near the bay as possible, for the sake of the shipping. Formerly, a gigantic time - ball was dropped at the observatory, which was visible to the ships four miles off in Table Bay; now a smaller time-ball is dropped electrically close to the docks by means of a wire from the Observatory.

The accurate determination of time is a very small part of the Observatory work; the position of stars is determined for the use of mariners; in fact, most of the Southern stars whose position is given in the "Nautical Almanac" are recorded there from observations taken at the Capetown Observatory. The most interesting work, however, to the general public is that which simply satisfies the thirst of the human mind for knowledge of what is observed in the heavens without any reference to commercial utility.

The lantern slides shown illustrated in a most interesting manner the methods by which the actual materials of the stars were ascertained. It was shown how iron was proved to exist in form of vapour in the sun's atmosphere, in the atmosphere of the bright star Canopas, and in that of Alpha Centauri. Hydrogen was also shown to be an element as abundant in the stars as it is on the earth. These wonderful revelations are due to the spectroscope. That instrument not only enables us to ascertain the materials of which a star is composed, but it actually can be made to reveal the motion of a star along the line of sight, to show whether it is aproaching to or receding from the earth, and the rate at which this takes place.

Three beautiful photographs were shown on the screen of the star Argus, and the portion of sky around it. This, the lecturer said, would, no doubt, be specially interesting to members of the Royal Society here from the fact that its records contain several papers read on the nebula of Argus by the late Mr. Francis Abbott, whose observations of the star and of its nebula extended from the years 1867 to 1872. This star has gone through the most extraordinary variations in brightness during the last 200 years. It was first observed at St. Helena by Halley; then at the Cape of Good Hope by Sir John Herschel. It increased in brightness, until it became the second star in the sky in 1843. During the 25 years following it steadily but slowly diminished. In 1867 it was barely visible to the naked eye, and the year following it vanished entirely from the unassisted view, and has not yet begun to renew its brightness. The time it was observed by Mr. Abbott it was a faint telescopic object, surrounded, however, by a remarkable nebula. A photograph of this was shown by the lantern, taken during an exposure of 45 minutes. A second photograph was shown of the same object from exposure of over three hours, and a third photograph from a 25 hours' exposure. In the first of these a considerable number of stars appeared in th field of view; in the second the number of stars was greatly increased; in the third (the 25 hours' exposure) revealed an absolutely countless multitude of stars surrounding the nebula. Many of these are too faint to be detected by the human eye. even when aided by the most powerful telescope.

Some groups of star clusters in other parts of the sky were shown, and it seemed as if there was no limit to the number of stars that could be revealed in a single telescopic field by photography. The star clusters were, in some cases, so dense as to appear like a continuous mass of light. Slides of nebulæ were next shown, and it was pointed out by the lecturer that at first nebulæ were supposed to be simply star clusters, the diffused light of which could be resolved into separate stars if we had a sufficient magnifying power; but modern observations, with the aid of the spectroscope and photography, show that this hypothesis is incorrect. The nebulæ have been proved to consist of vast spaces filled with glowing gas, which sometimes envelopes stars. These masses of gas generally have definite forms, the spiral being the most common.

The systematic study of nebulæ may be said to have commenced through the labours of Sir William Herschel at Slough. The discoveries that Herschel made were reckoned not by tens, nor by hundreds, nor by thousands. It was left to Sir John

Herschel, the only son of Sir William, to complete his father's labour of extending the survey to the southern heavens. He undertook, with this object, a journey to the Cape of Good Hope, and sojourned there for the years necessary to complete the great work. As the result of the labours thus inaugurated, there are now 3,000 or 4,000 nebulæ known to us, and with every improvement of the telescope fresh additions are made to the list.

Comets formed the next subject illustrated. Photographic slides were shown of Swift's comet of 1892. In the photographs of comets the stars had a remarkable appearance. Instead of being round dots, as in other photographs, they all appeared like a number of short arrows pointing in one direction. The reason of this was the rapid motion of the comet among the stars, which compelled the photographer, in order to keep the comet still, to represent the stars as moving. The length of each streak representing a star indicates the distance and direction of the comet's motion.

The process by which a comet's tail was developed, and the materials of which it is composed, were next discussed.

Some further photographs were shown of the sun and of the spots on his surface, and the lecturer concluded by remarking on the fascinating character of the study of astronomy, and the labour which had been expended upon it from the earliest ages.

The student of this subject finds an answer to many questions, but as he studies he finds that many more questions arise, which remain unanswered. Whence comes the fascination? Why is it that we, who are of yesterday, delight in the contemplation of such vast periods of time, of number, and of distance—such a boundless exhibition of force and grandeur? Surely, the answer must be "The heavens declare the glory of God."

A hearty vote of thanks was accorded to the lecturer.

The Chairman announced that at the next meeting Mr. J. W. Beattie would give a lecture, illustrated, on the East Coast of Tasmania, as visited by Tasman. At the September meeting Mr. A. Mault would read a paper on the timber industry. At the October meeting the secretary (Mr. A. Morton) would probably have some notes of his visit to Canada. That would be after his return from Vancouver, and, no doubt, he would have something interesting to say with regard to his visit.

Mr. Nat. Oldham operated with the lantern slides illustrating Mr. Kingsmill's lecture.

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## AUGUST 26.

Owing to the inclemency of the weather the meeting to be held this evening was postponed to September 9th.