journals as the "Ibis," "Stray Feathers," and the "Proceedings of the Geological Society," and the information afforded by such papers had proved of the greatest advantage to authors in the publication of recent works.

The paper dealt with some 64 species, and should prove of the tmost importance to ornithologists. Accompanying the paper was several interesting specimens of Terns and other sea birds.

NATURAL GRAFTING.

Note on a specimen of natural grafting, or inarching of the branches of the weeping ash (*Fraxinus excelsior pendula*), by F. Abbott, Superintendent Botanical Gardens. Mr. Abbott said the specimen laid on the table was one of natural grafting or inarching ; similar examples are occasionally met with, and it is most probable that the art of grafting itself originated with the ancients by cases of a like nature coming under notice. Several things are necessary to lead up to a union of this kind—1st. The branches must naturally be in the right position 2nd. A certain amount of friction is necessary to rub off the outer bark, and then some amount of quietude and repose is essential to allow the union to take place. As it is only occasionally that all these conditions can be fulfilled at the proper time good examples like the one under notice are not common, and on that account it may be of interest to those present.

The SECRETARY drew attention to a very valuable cast of a skull of an Australian herbiverous marsupial (*Nototherium Mitchellii*) an extinct animal, rather smaller in size than the *Diprotodon*. The fossil remains of this remarkable animal are found in New South Wales and the Darling Downs, Queensland. The secretary stated that this very valuable specimen had been presented by their very generous friends, the trustees of the Sydney Museum. Dr. Ramsay, the curator of the Sydney Museum, Mr. Morton stated, was always most willing to assist the Tasmanian Museum in making the Museum as complete as possible in their collections.

MAGNIFICENT SHELLS.

On the table were two magnificent specimens of *Pinna nobilis*, presented by Lieut. Beddome to the Museum.

VOTE OF THANKS.

The President proposed a vote of thanks to the authors of papers read, which was carried by acclamation.

OCTOBER, 1887.

The usual monthly meeting of the Royal Society of Tasmania was held on Monday evening, October 10th, 1887. The President, His Excellency Sir Robert Hamilton, occupied the chair at opening, and there was a moderate attendance of Fellows, and lady visitors.

List of additions to the library during the month of September :—

Bollettino della Societé Geografica Italiana, Ser. II., Vol. XII., Fasc, 6, 7, 8, 1887. From the Society

Bulletin de la Societé Royale de Botanique de Belgique, Fondée Le 1er Juin, 1867. Tome Vingt, sixieme, Anner, 1887. From the Society.

Journal of the Royal Microscopical Society, Part 4 , August, 1887. From the Society.

Leeds Philosophical and Literary Society's annual report for 1886-7. From the Society.

Monthly Notices of the Royal Astronomical Society, Vol. XLVII., No. 8. From the Society.

New Zealand Medical Journal, No. 1, Vol. 1., September 1887. From the Society.

Reports of the Mining Registrar of Victoria for the quarter ended June 30, 1887. From the Society.

Summary and Review of International Meteorological Observations, April and May, 1886. From the War department, Washington.

Transactions and Proceedings of the New Zealand Institute, 1886, Vol. XIX. From the Society.

Victorian Field Naturalist, Vol. IV., No. 5.

ANOTHER EXPERIMENT FOR THE ACCLIMATISATION OF SALMON, PROVIDED FOR BY THE HON. J. W. AGNEW.

The PRESIDENT said :—" I regret that I am unable this evening to remain to hear the interesting paper on the diamond diggings which will be read to you, as I leave by the express to-morrow morning for the Longford show, and have some business to attend to to-night. But I have come specially down to make an announcement which I am sure will be heartily welcomed by all the members of this society, and by the Tasmanian public at large, through the instrumentality of the Press, of whom I see some members here to-night, and who generally make our proceedings known. Rather more than a week ago Mr. Morton, our secretary, received a letter from Dr. Agnew, from Melbourne, in which he announced that he placed £500 at the disposal of the Royal Society, if they would undertake the trust, to give one more trial under the most favourable conditions to the introduction of a fresh supply of salmon ova for Tasmania—(hear, hear)—and he expressed his wish that Sir Thomas Brady, who has already done so much in the selection of ova should be invited to select this batch in that stage of development, which experience has shown to be the most suitable for handling it, to superintend its shipment, to accompany it to Tasmania, and to see to its deposit in the Salmon Ponds here. I need hardly say that the council who met at once to consider this munificent offer, heartily accepted the trust, and passed a vote of warm thanks to Dr. Agnew. We then appointed a committee of Fellows consisting of Mr. Seal, Mr. Webster, Mr. Belstead, Mr. Johnston, and Mr. Morton, with the view first of consulting the Government and obtaining their co-operation, and then of making the necessary arrangements. I am happy to say that the Government, as we expected, deeply impressed by Dr. Agnew's magnificent gift, gave their hearty concurrence, and are most ready to co-operate in every way, both as regards placing all their appliances at our disposal, and giving us the invaluable assistance of Mr. Saville-Kent, so far as it is now available, and of Mr. Seager. By last mail I wrote to the Secretary of State for the Colonies and the Lord-Lieutenant of Ireland asking that Sir Thomas Brady, who is an officer of the Irish Government, might be granted the necessary leave of absence to enable him to undertake the task, and expressing my strong opinion that not only much benefit might be anticipated to arise to the colony from Sir Thomas' proposed visit, but also that I felt sure the granting of his services for the purpose by the Imperial Government would be regarded by the colony as a gracious act on their part. I also wrote to Sir Thomas Brady, who is a personal friend of mine, inviting him to Government House during his stay in Tasmania. The committee are now at work, and I would suggest that any Fellows of this Society who have news on the subject should communicate with them.

We cannot, of course, say that this experiment will succeed, but we mean to do our best that it shall, and with the accumulated experience

now available I think we do well to be sanguine. I do not wish to be understood as giving my definite opinion that no salmon have ever been caught in Tasmania, for I do not hold that opinion; but undoubtedly the most ardent believer in the presence of salmon in our waters will admit that they do not flourish like the trout. Now, what we want to do is, by the aid of this magnificent offer of Dr. Agnew's, to set at rest all controversy on the subject, and to secure, as I am sanguine enough to hope, unless there is some insuperable climatic reason that we shall, before long, have the real *salmo salar* in Tasmanian waters. The most serious climatic consideration, no doubt, is the temperature of the sea surrounding Tasmania, but there is a great difference in the temperature of the sea in the north of Scotland and the south of England and south-west of Ireland, where the gulf stream infringes, and it might be well that some at least of the ova should be taken from these southern rivers. This, however, is more a matter for the committee than for the present meeting. They will be glad to receive any suggestions. In conclusion, gentlemen, on an occasion like this, with our minds full of Dr. Agnew's splendid liberality, we must not forget, and he would be the last, I am sure, to wish that we should forget or ignore the noble efforts which have already been made to introduce salmon into Tasmania. I regard this, and I am sure Dr. Agnew regards it, simply as one more effort under the most favourable conditions in the same direction. An effort which we all trust will be crowned with success, and, if it is crowned with success, such success will be largely due to the experience which has been gained from the previous efforts of Mr. Youl and other gentlemen, notably the late Salmon Commission, who have worked so hard for the colony in this matter." (Hear, hear.)

His Excellency then retired, and Sir Lambert Dobson took the chair.

The CHAIRMAN said he did not know whether any member would like to speak on the subject. No doubt they were all gratified with this liberality of Dr. Agnew, whose name was synonymous with liberality, and it was therefore like painting the rose to express any praise of it. (Hear, hear.)

DIAMOND DIGGING IN AFRICA.

Mr. JAMES ANDREW read a paper on "Diamond Digging in South Africa." He apologised for selecting a subject which did not possess a very scientific interest, though he thought it might prove of interest, as he found very little was known connected with it in this part of the world, and it was possible that diamond digging might become an industry in Australia as it had already been found in New South Wales. After giving an outline of the history of the discovery of diamonds at Griqualand, Mr. Andrew gave a very lucid description of the method of working, and some interesting particulars regarding the mines and the stones found.

The CHAIRMAN said the subject was not altogether new to him, as he had seen at South Kensington a large working model of the mines and the process of working. Even more interesting was an exhibition of the process of cutting the diamonds. Knowing how hard they were it was wonderful to see how simple the process was. There was a table with a number of rapidly revolving discs, over each of which an iron arm, about 18in. long, was arranged, and at the end of these arms there was a truncated cone on the end of which the diamond being operated upon was soldered. A workman by shifting the position of the arm, cut the facets with the nicest accuracy. What seemed a most difficult process was a very simple one indeed; but as a labour-saving process it was simply wonderful, and proved an interesting sight, around which a great

number of people was always found. He was sure they were all very much indebted to Mr. Andrew for the paper, which gave a most interesting account of diamond mining.

Mr. R. M. JOHNSON thought Mr. Andrew had no need to make any apology for reading such a paper, which was most interesting, and contained many particulars of a highly scientific character, set forth in a very clear and lucid manner. The origin of the diamond was a question of scientific interest, and he thought the carbonaceous shales referred to had something to do with it. He pointed out that diamonds had been produced by an artificial process, of which Mr. Ward could probably give an account. Most minute granules of diamonds had been produced on the heated surface of a tube, but the chemists came to the conclusion that it was only by a process that they could not command that the diamond of commerce could be obtained.

Mr. W. F. WARD explained that diamonds had been artificially produced from hydro-carbon, by condensation in vessels heated for a long time, but they were very minute, as were also the artificially produced rubies and sapphires, and cost five to ten times more than natural stones. Regarding the trimming of diamonds into shape, the work was sometimes roughly performed by splitting. the diamond having lines of cleavage. As to the origin of diamonds he scarcely thought carbonaceous shales could be credited, as that was a water formation in which they were deposited. His brother had forwarded a package of the Kimberley stuff to his father, who examined it to see if the beginning of a diamond could be found by the microscope. Many of the diamonds were broken up, and had apparently been formed in another rock.

Mr. T. STEPHENS thought all the authorities were agreed in connecting the diamonds with the igneous rocks in which they were found, but, as Mr. Andrew had said, the more recent authorities differed as to the actual origin. He congratulated the Society upon the character of the paper, and hoped Mr. Andrew would be persuaded to write something about the West Coast of this island of which he had an extended experience.

THE BUILDING ROTIFER.

Mr. R. A. BASTOW read the following paper on a Building Rotifer:— Until late on Saturday evening last I was under the impression that the rotifer now on the stage of the microscope was *Melicerta ringens*, or what is known commonly amongst microscopists in Great Britain as the building rotifer, but on further and closer examination I find that although it is of the same family of Floscularia, it is Limnias, and not Melicerta. Both animals are very beautiful, and have received much attention from Gosse, Slack, and other naturalists. The ciliatory wreaths projecting from their cases are of a singularly interesting appearance, and are continually at work, forming whirlpools to ensnare their prey. On the slightest alarm the creatures instantly rush into their homes, and when quiet is restored the flower-like wheelwork is again expanded therefrom. The Limnias possesses two large rotating discs, and a ringed case; the Melicerta, two large and two small discs, and a case made of pellets, which the little creature is continually adding to, as it were, brick by brick, these bricks and pellets being made by the animal itself. I have specimens under gradually increasing powers of magnification here on the table, each animalcula industriously working at its assigned task, and never resting, not even sleeping, until the work of its life is accomplished, and it ceases to exist. These were collected from the pond in front of the residence of Mr. Curzon Allport, Davey-street, and, being placed in a small aquarium, they have multiplied exceedingly." In connection with the paper were a number

of highly interesting specimens shown at work under microscopes of different power.

The CHAIRMAN asked, as they never slept and never rested, whether Mr. Bastow knew how long they lived ?

Mr. BASTOW said he had had them under a microscope for a month, but he did not know how long they lived.

Mr. R. M. JOHNSTON said he had seen two species of rotifer near St. Leonards with Mr. Harrap, of Launceston, who with one or two friends had made a valuable collection, and used formerly to write some interesting papers for the Society. He would like to communicate Mr. Bastow's observations to Mr. Harrap, and the secretary might ask that gentleman to again favour the Society with the result of some of his researches.

"ALPHA CENTAURI." BY A. B. BIGGS.

A paper on the double star Alpha Centauri, accompanied with a diagram showing a projection of its real orbit from its apparent curve was, in the absence of the author, read by the secretary (Mr. A. Morton.) The paper drew attention to the special interest attaching to this star, from its being, so far as known, the nearest fixed star to the solar system (225,000 times the earth's distance from the sun); that it is one of the finest objects of its class in the whole heavens; and, that being invisible to the observatories of the Northern Hemisphere, science is indebted to southern observers for all that can be known of it. A clear description was given of the method employed in the investigation, which included an enormous number of observations extending from 1818 to the present time, of which the author's measures extended from 1882.

The most interesting deductions from the investigation are as follows :—

The maximum apparent angular distance separating the pair is 23¼secs. of arc, which occurred in 1818, the next occurrence being in 1902. The actual mean distance of the comparison from its primary is a little over 20 times that of the earth from the sun. Its period of revolution is 84⅔ years, both period and distance corresponding very closely with those of the solar planet Uranus. The nearest apparent approach of the stars to each other was in 1885, namely, 1 7-10th sec. of arc, they being then so close that high telescopic power was necessary to divide them at all. The actual orbit is inclined (or tilted) from the line of sight 79deg., hence its apparent curve is a very long, narrow ellipse.

From the actual mean distance of the companion from its primary, and its period of revolution, the author computes the mass of the principal star to be about 1 1-7th times that of the sun.

The author's observations of the star were given in a table, and also an ephemeris showing positions and distances for subsequent years up to 1901.

THE ECHIDNA.

Mr. A. MORTON submitted a paper entitled "On the egg of the echidna, or porcupine." He stated that till the year 1883 very great doubt existed in the minds, not only of naturalists but of all observers as to how the echidna brought forth its young, when Mr. Caldwell, a student of Cambridge, who took the Balfour Travelling Scholarship, left to travel in the Australian colonies to study the embryology of the marsupial, the monotremata, and the ceratodus. Mr. Caldwell, with most other scientists, states that he was under the impression that the echidna and platypus were born in the same way as the marsupials; but in Queensland, assisted by the blacks, he was enabled to procure many specimens which set at rest the question, and enabled him to decide that they were oviviparous. This important discovery was made known to

Professor Liversidge, of the Sydney University, who sent a telegram to the British Association then sitting at Montreal, and Mr. Caldwell, on his return to Sydney, shortly afterwards exhibited several examples in different stages of development, from the egg just hatched to the egg, found upon dissecting the animal, ready to be laid. A great number of people were still under the impression that these animals were viviparous. In a book by Arthur Nicholls, entitled "Zoological Notes," published in London in 1883, the writer refers to the ignorance of the natives of Australasia and their statements that both the porcupine and the platypus laid eggs. The writer of this book went on to say that he had found, in dissecting the animals, the young of the platypus in the uterus. Though the two animals existed in this colony he could not find any record placing officially before the scientific world and the general public the fact that the eggs had been found here. Last month he had received a letter from Mr. Fletcher, who lived in the Campbell Town district, stating that while riding in that district, his horse had put his foot into a hole. Upon putting his hand into the hole he found a porcupine, which he lifted out, and an egg dropped from the animal as he lifted it breaking in its fall, exhibiting an embryo animal. Mr. Fletcher had very generously presented this specimen, comprising the broken shell and the animal to the Museum, which he (Mr. Morton) was very proud to get as an interesting record, which further established the facts discovered by Mr. Caldwell. The paper was mostly a technical description of the egg and the anatomy of the animal, agreeing with Mr. Caldwell's description. The egg was about three-quarters of an inch long.

Mr. A. J. Taylor said he had listened with pleasure to the remarks which had fallen from Mr. Morton, as they were of the highest scientific interest. He pointed out that in 1849 Dr. Milligan had reported that the natives said echidna laid eggs, so it was clear that before accusing the natives of ignorance, writers should know more of the subject. The statement Mr. Morton had been enabled to make was one he ought to be very proud indeed of.

Mr. R. M. Johnston congratulated the Soceity upon the paper and the specimen, which was of the highest value to the scientific world. It would corroborate the investigations of Mr. Caldwell, so ably carried out in these colonies, and Mr. Morton was to be congratulated on this important addition to the demonstration of the true mode in which the echidna brought forth its young. It was not a discovery on the part of Caldwell so much as a scientific demonstration, as statements had been made on both sides, but there was no evidence before the scientific world. Mr. Caldwell had solved, the doubt, and any addition to the proof would be a satisfaction to that gentleman, as well as to all others interested in science.

THE WHITE HAWK.

Mr. Morton stated that Mr. Arthur Brent, an enthusiastic collector of birds eggs, had informed him of the discovery of a nest and eggs of the common white hawk, *Astur novæ-hollandiæ*, generally known as the Goshawk. The nest, formed of small twigs, lined with the leaves of the peppermint tree, was discovered in a stringybark tree, 60 or 70 feet from the ground, in a gully near Austin's Ferry. It contained two eggs of a blotchy colour, though they were of a bluish colour inside when blown, and something like the Allied Harrier. So far as he knew the eggs of this bird had not been found here before, and he promised to take the measurement and description and give the particulars at the next meeting.

Mr. Swan said he had never heard of the eggs having been found before, but Mr. Bethune, of Dunrobin, had found a nest with the young birds in it.

ORCA CAPENSIS.

In reference to a specimen upon the table, Mr. STEPHENS said that some of the Fellows present might remember a rumour from Launceston a few months ago of the discovery in the neighbourhood of Piper's River of a fossil jawbone of a gigantic extinct animal. Inquiry having been made, Mr. W. P. Hales had kindly secured and forwarded the specimen, when it turned out to be a weather-beaten portion of the skull of an Orca, several species of which inhabit the Southern Ocean. There being no means at hand of identifying the species, the bone had been sent to Mr. E. P. Ramsay with a request that he would kindly compare it with the specimens in the Australian Museum. Mr. Ramsay promptly replied as follows :—" The bone, as you justly remarked, is the jaw of an Orca, the right upper portion of the maxilla ; it agrees best with O. capensis, but has a less number of teeth." Mr. Stephens went on to say that this was a very variable genus, and that Gray and Van Beneden differ as to the number of teeth in Orca capensis, the former giving 12-12 – 12-12, and the latter 13-13 – 13-13, as the formula. The Orcas, or killers, as they are popularly termed, are without exception the most ferocious inhabitants of the ocean, and even the largest sized whales are not safe from their attacks. There is a good skeleton of Orca pacifica in the Museum.

VOTE OF THANKS.

The CHAIRMAN proposed a vote of thanks to the authors of the very interesting papers that had been read, which was carried by acclamation.

The meeting then terminated.

NOVEMBER, 1887.

The final monthly meeting of the Royal Society of Tasmania for the 1887 session was held on November 21. The President, His Excellency Sir Robert Hamilton, K.C.B., occupied the chair, and there was a very large attendance of Fellows and visitors, including many ladies. His Excellency was accompanied by Miss Hamilton, Miss Hervey, and Mr. H. W. B. Robinson.

NEW MEMBERS.

Messrs. J. S. Laurie and J. F. Echlin were elected Fellows of the Society.

EXPLORATION OF MOUNT MUNRO.

The SECRETARY read the following letter from Baron Von Mueller :—

" November 19, 1887. To the Hon. Sec. Royal Society of Tasmania.—Allow me, honoured sir, to inquire whether possibly some arrangements can be made this summer by your amateur naturalists to explore Mount Munro, on Clarke Island, in the interest of geology, zoology, and physiology. So far as I am aware, this mountain has never yet been visited for the purposes of science beyond triangulation, and as it is nearly as high as Strzelecki Peak on Flinders Island, where Dr. Milligan made so many important observations on minerals, insects, and plants, any researches carried out on high elevations of Mt. Munro should also be replete with novel interest. Perhaps during the Christmas and New Year's holidays some of the Tasmanian scientists could unite for a tour to Mount Munro, which would not involve more expenditure and exertion than spending the holidays in other and less profitable excursions. The Field Naturalists' Club of Victoria, at my suggestion, will institute researches on King Island next month. If from Hobart and other places the Mount Munro region were searched for, Tasmanian science might be expected.—Respectfully yours, FERD VON MUELLER."