ROYAL SOCIETY.

JUNE, 1870.

The monthly evening meeting of the Society was held on Tuesday, 14th June, James Barnard, Esq., in the chair.

The following gentlemen, who had previously been put in nomination by the Council, were, after a ballot, declared duly elected as Fellows of the Society :—F. Aubin, Esq., Spring Bay ; C. J. Willes, Esq., Oatlands ; R. McI. Isaacs, Esq., Hobart Town ; R. C. Read, Esq., Redlands, New Norfolk.

The Secretary, Dr. Agnew, submitted the following returns for the month of May ; viz. :—

1. Visitors to Museum, 514.
2. Ditto to Gardens, 1969.
3. Plants received at Gardens.
4. Leafing, flowering, and fruiting of a few standard plants in Society's Gardens.
5. Books and Periodicals received.
6. Presentations to Museum.

Meteorological Returns.

1. Hobart Town, from F. Abbott, Esq., Table and Summary for May.
2. Port Arthur, from J. Boyd, Esq., ditto for April and May.
3. Swansea, from Dr. Story, ditto for February, March, and April.
4. Queensland, from the Government Observer, tables for August, September, and October, 1869 ; January, February, March, 1870 ; and table shewing rain-fall at various stations during February.
5. New Zealand, from the Government, tables for February.
6. Melbourne, from R. L. J. Ellery, Esq., table for April.

Accompanying the returns from Swansea were some remarks by Dr. Story, from which the following extract was read :—

"We have now (19th April) had nearly six inches of rain since the beginning of the month, more than has fallen in so short a time for many years ; it will no doubt act beneficially upon all vegetation. I have always observed that after a drought the rain first began in New South Wales, and when we heard of it falling there we shortly had it on the East Coast ; but this time it has been longer in reaching us than I ever before knew. Now we have had as much rain as will moisten the deepest roots."

The presentations to the Museum and Library were as follows :—

1. From G. Dinham, Esq.—A copy of "The whole workes of W. Tyndall, John Frith, and Dr. Barnes, three worthy martyrs and principal teachers of this Churche of England, collected and compiled in one tome together, being before scattered, and now in print here exhibited to the Church. To the prayse of God, and profit of all good Christian Readers. At London. Printed by John Daye, and are to be sold at his shop under Aldersgate, An. 1573."
2. From H. Cook, Esq.—"A brief and accurate treatise concerning the taking of the fume of tobacco." By Tobias Venner, Doctor of Physic, 1621.
3. From T. Giblin, Esq.—A list of subscribers (with signatures), to a testimonial for presentation to Mr. Taylor, of Macquarie River, for his spirited and manly conduct in resisting an attack upon his house by escaped convicts from Macquarie Harbour. Dated 20th July, 1824. [Of the forty-six persons whose names appear in this interesting document, only four are now living]
4. From Mr. Cearns.—Large specimens of Oysters from North-West Bay.

5. From Mr. R. A. Jeffrey, Campbell-street.—Two large Mussels, from near New Wharf.
6. From Mr. R. Giblin.—A fish said to have been taken in Mr. Walker's mill-race.
7. From J. Butler, Esq., Dunedin, per J. W. Graves, Esq.—A thigh bone of the Moa (*Dinornis sp.*)
8. From Rev. H. D. Atkinson.—Specimen of Ibacus, from Three Hut Point.
9. From the Hon. J. Maclanachan, Esq.—A Carolina Drake, and a Peacock.
10. From Captain Serckoff, H.I.M.'s corvette "Boyarin."—A collection of Russian coins, viz:—Gold—5 roubles (half imperial), Russian. Silver—20 kopeks, Russian; 15 ditto; 10 ditto; 5 ditto; 25 penny, Finnish. Copper—5 kopecks, Russian, old mint; 3 ditto; 2 ditto; 1 ditto; 5 ditto, new mint; 3 ditto; 2 ditto; 10 ditto, penny, Finnish; 1 ditto.

In reference to presentation No. 5, Mr. M. Allport remarked that these enormous mussels (which measure eight inches in length, and the same in girth are of a different species to the small common kind. They are remarkable for having a disk-like termination to the fibres of the byssus, several of which fibres are seen to be attached to the external surface of the shell. This species is found in mud in deep water, and specimens have been obtained from Southport and Spring Bay, as well as in the harbour.

Dr. Agnew then referred to the subject of the red spider of the hop, which he had brought under the notice of the Fellows at the last monthly meeting. As he then feared, he had not been able to procure from Sir R. Officer any better specimens of the insect, owing no doubt to the lateness of the season. On microscopic examination, however, of those sent they were found to be identical with the *Acarus telarius*, as figured in McIntosh's Book of the Garden, vol. 2, p. 77; although a later authority gave it the name of *Gamasus telarius*—an allied genus of the same great class, *Arachnida*. It is oviparous, and many broods are hatched during the season. The ova are probably for the most part deposited on the under surface of the leaves, whence the young when hatched can extract nourishment, but it is possible some may also be deposited in the bark of the hop poles, or even in the ground (as suggested by Mr. M. Allport), where the animals themselves are found in great numbers. The presence of the pest is attempted to be accounted for in two ways. Some think the hop itself from exposure to high winds, from scant supply of water or manure, or from other causes, first becomes sickly, and thus favours or provokes the development of the spider. Others think the fault is not in the plant in the first instance, but that under some peculiar and unknown influence, whether atmospheric or telluric, or by consent of both, vast developments of animal life take place at certain periods in a manner not yet accounted for. We have all seen plagues of green beetles, aphides, and caterpillars, and again we read of locusts, grasshoppers, etc., appearing in one year in overwhelming numbers, and in the next being almost altogether absent; and as these visitations take place without any apparent disease having previously existed in the plants destroyed by them, the inference was in favour of the latter view, viz., the primary development of animal life, and with this he (the speaker) was inclined to agree. In either case the effect would be the same; the weak and sickly plants would first yield to the attack of the enemy, whilst the strong and healthy would make a struggle, in many cases a victorious one, for existence. By the assistance of Mr. Roblin he had mounted specimens of the acari from the hop, from some hot house plants, and from the apple tree. For the last, which was accompanied with several ova, he was indebted to Mr. Stephens, who had paid a good deal of attention to the subject. These were placed under the

three microscopes now before the meeting, and the Fellows could examine them for themselves. All were evidently of the same genus, which also embraced the parasite of the itch in man, and of the scab in sheep, etc. As to remedial measures, he could scarce offer any suggestions. As a matter of course, seeing that the healthy plant alone had a chance of resisting the destroyer, every suitable hygienic measure should in all cases be adopted. Due shelter from winds should be afforded. If the ground was found to be exhausted of any necessary chemical element, this should be restored, and proper quantities of manure and water furnished. From the numbers of the animals he had seen in the bark it was evident the poles should be carefully deprived of their bark, and it would probably be advisable to soak them in tar before setting them up. This could be done very cheaply, by means of rude wooden troughs of the same length as the poles, as coal tar could be procured at a nominal price from the gas works. The poles would thus be no longer a nidus for the parasite. As to any application to the plant itself, it was difficult to imagine how it could be effected as it was impossible to reach by any means at our command, the under surface of the leaf where the insect and the ova were chiefly found. The soil itself, however, as has been already noticed, was greatly infested, and here the same agent, sulphur, which was so noxious to the acarus (itch) in man and in sheep (scab) naturally suggests itself, as a possibly effective application. A pound of sulphur mixed with a pound of quicklime, might be boiled in a gallon of water for half an hour. When cold, the clear liquor to be diluted with water in the proportion of about one to sixty. This, by means of a watering-pot, would be of easy application, and if found to answer, would probably be as cheap as any other remedy, as sulphur, if in large demand could, he was informed, be obtained in any quantity, and at a very moderate price from New Zealand or its vicinity.

Mr. M. Allport remarked he had been speaking on the subject a few days ago to Mr. Wright, who informed him that sulphur had been tried at home, but was decidedly objected to as it was found to be injurious to the plant, although it was made use of with advantage in the preparation of the hop for market.

Dr. Agnew did not know anything of the matter practically, but thought if the experiments made at home were not conclusively adverse to the sulphur, it would be well worth trying it in the manner indicated, if only on a small scale, and on a few plants in the first instance. (As tobacco is noxious to the parasite and can be grown so cheaply, would it not, in the case of so valuable a plant as the hop, be worth a trial in the form of a very dilute decoction applied in the same manner as suggested for sulphur? If the pest were treated vigorously by either of these means, on its first appearance, even at the risk of injuring some of the plants, a great discouragement might be given to its further progress, and thus the nuisance be at least abated if not abolished.)

Mr. Davies considered the subject just treated was one of considerable interest, and suggested that the remarks by the honorary secretary should appear in the form of a paper. Dr. Agnew promised he would at all events notice the discussion at length in the official report of the proceedings.

Mr. M. Allport said: Mr. Chairman and gentlemen, at the risk of wearying you with the frequent recurrence to one subject, I must again refer for a few moments to the small salmonoid first sent to England. By the mail before last, Sir Robert Officer received a letter from Mr. Youl, which contains much that will interest the Fellows of the Society, especially as it tends to prove, as I have long suspected, that the difficulty of distinguishing between the smolt of the true salmon (*Salmo salar*) and the smolt of the sea trout (*Salmo trutta*) is very great. Mr. Youl says:—"I brought the little fish home from Dr. Günther's, and carefully examined

it myself with my son-in-law, a medical man. We did this first with the description of the different varieties of the salmonidæ and directions given by "Yarrell" for distinguishing them, but not being able to come to any decision we went to a fishmonger, and upon carefully comparing it with a full grown salmo salar, concluded that upon the whole it was a salmon or sea trout, *Salmo trutta*, of Linnæus. After this I took the fish to Mr. J. K. Lord, the principal editor of *Land and Water*, a person fully competent to give an opinion, and with whom I had a personal acquaintance. Upon examination Mr. Lord stated his belief that it was a true *Salmo salar*. I asked him to examine it again, which he did in my presence and with his pocket microscope, when he again stated his belief that it was a true *Salmo salar*, but said if I would leave him the fish he would take time and give it a more careful examination; this I did, and upon seeing him again he said that he had altered his opinion and thought it was a salmon or, sea, trout. I then told him for the first time that the fish came from Tasmania, and that Dr. Günther had pronounced it to be a salmon trout Mr. Lord at the same time assured me that he had never heard anything about the fish until that moment, and that his opinion was formed without any knowledge of where the fish came from or that anyone had given any opinion about it. He also mentioned that at the age of the fish it was most difficult in his opinion to decide positively to which of the two species it belonged. I think it right to mention, that after leaving the fish with Mr. Lord I went to one of the largest fishmongers with my "Yarrell" and microscope, and was fortunate in seeing and examining three beautiful sea trout weighing from $1\frac{1}{2}$ to $3\frac{1}{2}$ lbs., and certainly I must confess that the teeth on their vomer corresponded exactly with those of your fish. I cannot, however, I must candidly own, make up my mind that it is a salmon trout, because if so it must have been as you well know at least 3 years and 5 months old when it was caught, and therefore ought to be half as large again as it is. You will note that Mr. Lord at first, and after a careful examination, pronounced it to be a true salmon. It was not till after a further and more extended comparison that he altered his opinion; it is, therefore, not to be wondered at if you and Mr. Allport should prove to have formed an erroneous opinion upon so difficult a point." It is a law of nature that the species and varieties of one given genus of animals resemble one another far more closely in the early stages of their existence, than they do when arrived at maturity. No birds differ more in the mature plumage than ducks, yet there are dozens of species that no naturalist could determine during the first few weeks of their lives. I do not mean to say that a Tasmanian black duck of a fortnight old could not be distinguished from an English wild duck of the same age, if they were placed in juxtaposition; but that they resemble one another so closely, that it would be next to impossible to determine to which species either belonged, if examined alone. And no reference to a fully mature duck or drake could be of any service in solving the difficulty. Amongst the large carnivora in the genus felis we find the tiger, the lion, and the panther, each perfectly distinct when full-grown, yet the cubs all exhibit the striped skin, which is only found in the mature tiger, the stripes being lost in the lion, and changed to spots in the panther. Instances might be given from every division of the animal kingdom, but to come to fish, the genus Thyrsites contains two of our commonest fish, the king-fish and barracouta, and no one who has turned his attention to the subject could have any difficulty in distinguishing between them when grown, yet both Mr. Giblin and Mr. Buckland (either of whom it would be difficult to puzzle with a Tasmanian fish), would find it hard to determine the species of one or the other when four or five inches long. From this natural law, it follows that the more closely species approach one another when mature, the more difficult is it to distinguish

between their young; and as the mature salmon more closely resembles the salmon trout than the king-fish resembles the barracouta, I should expect to find that the difficulty of distinguishing the one smolt from the other was enhanced. And if we turn to Mr. Youl s letter, we find Mr. Lord, from the outer appearance of our fish, at once pronounced it a true salmon, and, after re-examination again pronounced it a true salmon, but, after having the fish left with him, changed his opinion. Unfortunately, Mr. Lord does not tell us why he changed his opinion; but, from Mr. Youl's observations as to his own reason for thinking the fish a salmon trout, it is all but certain they were both puzzled by the presence of the vomerine teeth in our fish, and in the mature salmon trout (*Salmo trutta*) whilst such teeth were absent in the mature salmon (*Salmo salar*). And here I must trouble you with two short extracts from "Yarrell," who, at pages five and six, says:—"The teeth of the salmon are short, stout, pointed, and recurved. As stated in the generic characters, they occupy five situations at the top of the mouth: that is, a line of teeth on each side of the upper jaw, a line on each palatine bone, with one line on the vomer between the palatine bones when young; but the salmon loses a portion of the vomerine teeth during the first visit to salt water. I have observed that some specimens of the migratory or sea trout carry their vomerine teeth longer than the salmon; and those trout which do not migrate, appear to carry their vomerine teeth longer than those trout which do migrate. The teeth on the vomer of the salmon, when the fish is old, seldom exceed two or three in number, sometimes only one, and that placed on the most anterior part. The salmon has, besides these, two rows of teeth upon the tongue, and one row along the outer upper edge of each lower jaw-bone." In speaking of the teeth of the salmon trout, at page 79, Yarrell says:—"The teeth are more slender, as well as more numerous, than in the salmon or grey trout; those on the vomer extending along a great part of its length, and indenting the tongue deeply between the two rows of teeth that are there placed, one row along each side." Does not this at once reconcile the presence of vomerine teeth in our specimen with its being a true salmon smolt? The Fellows of this Society well know how much we are already indebted to Mr. Youl for his unceasing exertions in this undertaking, and the Salmon Commissioners had no right to expect him to give up more of his valuable time for their advantage, still I hope that before the season was quite over our fish may have been compared with an undoubted salmon smolt from Stormontfield which had reached the same stage of development, because I believe that vomerine teeth will be found identical in the two specimens.

Mr. Davies, in referring to a paper by Mr. Barnard (read July, 1868) on the Esparto grass, mentioned that the Hobart Town *Mercury* newspaper had been printed for several months on paper manufactured from that material; and asked if Mr. Barnard had acquired any fresh knowledge on the subject.

Mr. Barnard stated that since the paper referred to by Mr. Davies, he had laid further information on the subject before the Society (July, 1869), from which it was evident that the cultivation of the grass could not be attempted in this colony with any chance of profit or success, and he had taken no further interest in it.

Mr. M. Allport observed it was well known that no vegetable product which required cultivation could be profitably grown for the manufacture of paper. Even if the waste lands of the colony were sown with Esparto grass seed, as had been suggested, this climate would be unsuitable for the plant.

On the motion of Mr. Justice Dobson, a vote of thanks was given to Mr. Allport, Dr. Agnew, and the donors of presentations, and the meeting separated.