they lead to conclusions which we know to be geographically false, and we therefore refuse to accept them.

Royal Naval College, Oct. 16

J. K. LAUGHTON

Fossil Oyster

Ostrea callifera from the Hampstead beds is described at page 145, and figured on Plate I., of Forbes's "Tertiary Fluvio-marine Formation of the Isle of Wight." Perhaps this is the one "Inquirer" has found.

T. G. B.

THE PENNATULID FROM WASHINGTON TERRITORY

I PRESUME this disputed organism, referred to in two communications in your number for September 26, is specifically identical with a specimen from Frazer River, British Columbia, presented to me in the autumn of last year, for the Museum of the University, by Mr. Selwyn, Director of the Geological Survey of Canada, and which had been obtained by Mr. Richardson, one of his assistant geologists. I at once recognised it as the axis of a Virgularia, or some similar creature; but there being no means of reference here for the West Coast species, I submitted it to Prof. Verrill, of Yale College, who had no doubt as to its nature, but believed it probably to belong to an undescribed species. There being no sufficient materials for its description, Mr. Whiteaves of this city, who undertook the description of the marine animals procured by the Survey in British Columbia, merely noticed it in his report as an undescribed pennatulid. Its characters were stated by him in a paper read before the Natural History Society of Montreal last winter, and printed in abstract at the time. Mr. Richardson, who returned to British Columbia in the spring, has undertaken to procure, if possible, a perfect specimen, and to have it preserved in alcohol. Should he succeed, we may hope soon to have materials for the description of the species. Mr. Selwyn's specimen, though it has probably lost several inches of its length, being broken at both ends, is five feet one inch in length. It retains, attached to the granulated lower extremity, some traces of animal matter, in which I think I can detect, under the microscope, a few club-shaped spicules.

McGill College, Oct. 11

J. W. DAWSON

DR. HOOKER'S REPLY TO PROF. OWEN

THE Blue Book issued in August last, containing the correspondence between Dr. Hooker, Mr. Ayrton, and others respecting the management of and control over Kew Gardens, included also, in the form of an appendix, a statement addressed to Mr. Ayrton by Prof. Owen, containing various allegations detrimental to the present management of the gardens, herbarium, and museum. The following reply by Dr. Hooker to these allegations has just been printed by order of the House of Commons:—

"Prof. Owen divides the 'aims and applications' of the Royal Gardens of Kew, according to his view of them, under seven heads.

"It is sufficient to state that some of these are recognised by the Government, and specified in their instructions under which the Director carried out his duties; but that others, and those of a most comprehensive nature, have no place there, and are not such as pertain to botanical gardens elsewhere. Amongst these are the agricultural operations specified by Prof. Owen, 'the application of manures, demonstrations of the fittest species of grasses for particular soils . . . methods of irrigation, subterranean pipe, conveyed liquid manures, and so forth,' all of which are being carried out with vigour and success by various agricultural societies and private individuals throughout the country.

"To establish such operations at Kew would involve an enormous expenditure, and occupy many acres of ground

now devoted to the legitimate purposes of a botanical garden.

"Illustrations of rock-works, garden sculpture, and ornamental waters, also recommended by Prof. Owen, appear to be equally out of place.

"Prof. Owen is in error in stating that the arrangement of plants in natural groups, with conspicuous labelling, &c., is at Kew 'at present limited to the herbaceous grounds;' as he is also in implying that there is no illustration of 'geographical distribution,' which is, in truth, carried out to an incomparably greater extent at Kew than in any other garden known to me at home or abroad. Prof. Owen cannot have visited the houses devoted to ferns, orchids, succulents, aroids, &c., nor the arboretum, fruticetum, and pinetum, nor observed the arrangement on the shelves of the two great buildings, the palm stove and the temperate house.

"The fact that a first-rate herbarium and library must be maintained for the purposes of a botanical garden, and in immediate proximity to it, has not only been uniformly admitted and acted upon by successive Governments, but is so universally recognised by naturalists everywhere, that I am surprised that Prof. Owen should dispute it.

"I am sure that were he acquainted with the nature and amount of the duties devolving on this establishment, he would abandon his opinion without hesitation.

"In support of the contrary opinion he refers to that early period in the history of Kew, when its new and rare plants were named at the Banksian herbarium in London. But the naming of a few new and rare plants cultivated at the beginning of the century in a private garden of nine acres, probably at no one time containing more than 4,000 species, is a very different matter from keeping accurately named public collections that occupy 300 acres, and are estimated to contain 20,000 species; and this in an establishment that is annually called upon to name literally thousands of plants from other botanic gardens and nurseries in England and similar institutions abroad. A great deal of the naming, and keeping correctly named, the plants at Kew, can be conducted only by skilled botanists visiting the grounds daily. Large classes of plants are now cultivated that must be named in the houses where they grow; and many more, the tropical especially, could not be sent to a distance to be named, without serious damage *in transitu*.

"To this must be added the necessity of naming and ticketing with copious information the vegetable products of economic interest, in three museum buildings, the illustration of which products by specimens, Prof. Owen admits to be a legitimate object of the Gardens of Kew.

"Nor was the naming of the Kew plants carried out in London, as is supposed; there was a large herbarium in constant use at the Royal Gardens at the very period alluded to, the breaking up of which, when it was proposed to give up the Gardens, necessitated the formation of another.

"No comparison whatever can be instituted between the needs in these respects of the Royal Gardens at Kew and the Zoological Society's Gardens in the Regent's Park.

"The reflections that follow on the conduct of the late and present Directors of Kew Gardens are not suited for official discussion.

"Prof. Owen is in error in asserting that the main end or drift 'of Dr. Hooker's evidence before the Scientific Commissioners is to impress upon them the necessity of the transfer of the collection of dead plants' from the British Museum to Kew.

"My evidence is unequivocally opposed to such a transfer.

"Herbaria are not costly establishments, but the least expensive of all natural history collections; and the objects and applications of botany in its largest sense, are now so numerous and so important, as to render a division of the subject necessary; whence the expediency of

maintaining a country and a metropolitan department, each with a herbarium as the most essential, but least expensive of its adjuncts, may readily be demonstrated.

"So far from desiring that the British Museum herbarium should come to Kew, I should propose to recruit it from that at Kew, which could be done to its very great advantage.

"Prof. Owen's approval of the saying of 'a great wit and original thinker,' that 'the net result' of a herbarium is the 'attaching barbarous binomials to dried foreign weeds,' will not find an echo amongst those conversant with the subject. Had it been otherwise, successive ministers would hardly have tolerated the existence of the Kew herbarium, or of that at the British Museum either.

"The disparaging remarks that follow on the views of his duties held by the late director, and on his performance of them, are not best dealt with by the counter assertions of his son; they are best disposed of by certain passages in the Treasury Minute that follows Prof. Owen's statements, and by the unanimous verdict of the late director's countrymen and foreigners everywhere.

"The suggestion is offered that an official inquiry should be made of leading gardeners to ascertain 'the kind and degree of information and aid which they derive or have derived from the National Establishment.'

"The answer to this has already been given, in the addresses to the Premier by the Royal Horticultural Society as a body, and separately by its Floral, Fruit, and Scientific Committees; and by the meeting of botanists and horticulturists held in London; and by the concurrent evidence of gardening periodicals throughout this country.

"The statement that the Royal Gardens had not fulfilled their function of introducing new, rare, and beautiful plants is best met by a reference to the pages and illustrations of the *Botanical Magazine*, a work that has issued monthly (and without a month's intermission) from Kew, ever since 1840, edited by the Director, and which is devoted to new, rare, and interesting plants, the larger proportion of which have flowered at Kew.

"The passage relating to the avenue of deodars and limes along the Syon vista, the formation of which is censured as a failure at the cost of 'hundreds or five hundreds' of trees, is founded on a complete misapprehension. Without going into detail, it is sufficient to state that not twenty deodars have been sacrificed, and no limes at all.

"The censuring of the Director for removing the araucarias from Richmond Park to Kew is equally founded on a misapprehension. These araucarias were twice offered to Kew before they were accepted; they stood in a private piece of ground, whence their removal was considered by their possessor to be a necessity; and the alternative of removal to Kew was their destruction.

"My predecessor is censured for neglect of the great araucaria, which, it is implied, is consequently inferior to that of Dropmore. The facts are as follows:—

"This araucaria, with four others, was brought to Kew in 1796, and kept in a greenhouse.

"In 1808 it was planted out in a poor sandy soil, and being supposed to be tender, was enclosed in a wooden house for many months in the year, in consequence of which its growth was checked, and it was rendered so weak that it was almost killed in 1838.

"It was not till the late Director took office in 1840 that the house was abandoned, good soil given to it, and other means taken (which have been sedulously repeated ever since) to encourage its growth.

"It is now a striking object 30 feet high and 90 in girth of the branches; and if not nearly so handsome an object as the Dropmore araucaria, this is partly due to the fact that the Dropmore tree was planted out at once, in a soil and situation as admirably adapted to araucarias as those of Kew are naturally unsuited to them; and partly

to the fact, probably unknown to Prof. Owen, that there are two very distinct forms of this species, a conical, and a round-headed, of which the Dropmore specimen belongs to one, and the Kew specimen to the other.

"Of the other four plants, one is that now at Dropmore; a second was killed by cold at Kew early in the century; the third was given to Sir Joseph Banks at Spring Grove; and the fourth at a later period, to Prince Albert, and taken to Windsor.

"In the contrast drawn between the herbarium establishments at the British Museum and at Kew, it is stated that the staff of the former consists of three officers, with aggregate salaries of 850*l.*, and 'that their time is exclusively given to the duties for which they are paid;' whereas the aggregate salaries of the three herbarium officers at Kew is 750*l.*, and that one is Professor of Botany in University College, and another a lecturer at a London Medical School.

"I am surprised that Prof. Owen should be unaware that one of his own three officers is botanist to the Royal Agricultural Society, and another a lecturer at a London Medical School, and editor of a valuable botanical journal.

"Nor does Prof. Owen in his comparison take into consideration that the Kew herbarium is open from 8.30 A.M. till 5 P.M. in winter, and 6 P.M. in summer, whereas the British Museum herbarium is open only from 10 to 4 in winter, and 10 to 5 in summer; as also that the Kew officers have not only the keep of the largest and most frequented herbarium in the world, but of a very large library, and have the duty of naming all the plants throughout the gardens and museums, together with many other duties that do not fall upon the British Museum officers.

"The fact is, that the exigencies of this establishment require that the herbarium should be open during that long period, but the officers are not required to be in attendance, and at their work, for more than seven hours daily throughout the year.

"Those seven hours (and to their honour be it said, often many more) are devoted exclusively to the duties of their respective offices.

"That the officers both of the British Museum and of Kew should be chosen to conduct the very brief professional and other duties which they perform elsewhere (at their own time), is both honourable to themselves, and in many ways advantageous to the establishments with which they are officially connected, always assuming that these vocations do not interfere with their working hours at Kew, and at the British Museum, or with their powers of work during those hours.

"The statement that there are at Kew 'a special curator of the museum, &c., and an assistant at 315*l.* per annum,' is an error.

"There is but one curator for the three museums, and his salary is 120*l.*, rising to 150*l.*, without a house or any other advantage; he has no assistant, and never had one.

"The last of Prof. Owen's statements to which I shall allude are the following, which I quote *verbatim*:—

"Dr. Hooker has been enabled to publish, or aid in the publication of, 130 volumes on botanical subjects. . . .

"To the extent or proportion in which the Director's time has been diverted from the immediate aims of the Royal Gardens to this foundation of his scientific fame, the proportion of his salary of 800*l.* per annum must also be placed to his credit of the superaddition of the dead plants to the Botanical Department under the Board of Works, competing with the Botanical Department under the Trustees of the British Museum."

"The first statement in this extract has no foundation in fact; it would ill befet me to notice the insinuation contained in the last.

"(Signed)

"JOS. D. HOOKER, Director

"Royal Gardens, Kew, Aug. 6, 1872"