Mr. Pourtalès' first dredgings, were written under very considerable difficulties, as I well remember hearing from the author himself. But the 'priority in scientific research,' which Mr. Rathbun claims for Pourtalès' work, had been accorded to it four years previously, at the earliest possible opportunity, in the Proceedings of the Royal society. So far as I know, this honor has never been 'denied' to one who would have been the last to claim it for himself. I fully admit, however, that the date of his earlier work has been incorrectly given in certain popular accounts of the subject; but this was done accidentally, and without the slightest intention of appropriating any credit for the work of British naturalists which was justly due elsewhere, as will be evident from what I have said already.

P. HERBERT CARPENTER.

Eton college, Windsor, Eng.,
Aug. 11.

The 'bassalian fauna;' 'Pentacrinus asteriscus.'

I notice that Mr. Gill has "recently proposed the name 'bassalian realm' for the collective deep-sea faunas." I do not know whether it is proposed to define this name more strictly by assigning to it any particular bathymetrical limits; but it may be well to notice, that, in his presidential address to the biological section of the British association at Plymouth in 1877, Mr. Gwyn Jeffreys suggested the use of the name "'benthal' (from the Homeric word *βένθος*, signifying the depths of the sea) for depths of one thousand fathoms and more," while retaining the term 'abyssal' for depths down to one thousand fathoms.

There is another point to which I have long thought of directing the attention of the readers of *Science*, and I therefore take this opportunity of doing so.

The surveys of Hayden, Wheeler, and others, in Utah, Idaho, and Wyoming, have revealed the very wide distribution, in beds of Jurassic age, of a crinoid which has been called Pentacrinus asteriscus. Nothing is known of this form but a number of stem-joints (I speak under correction, and shall be pleased to hear that I am wrong); but most of the figures of these joints which I have seen (e.g., that given by White in the paleontology of Wheeler's survey) seem to me to indicate that the type should be referred to Extracrinus rather than to Pentacrinus. The essential characters of the stem-joints of Extracrinus are well shown in plate liii. of Buckland's 'Geology and mineralogy,' figs. 9–13; on tab. 101 of Quenstedt's 'Encriniden,' especially figs. 24, 27, 33, and 37; and also on plate xii. of the Austins' 'Monograph of recent and fossil crinoids.' The five interradial petals are quite narrow, and much less distinctly oval than in Pentacrinus, sometimes becoming almost linear, with rounded outer ends. The interpetaloid spaces are plain, and devoid of sculpture; while the markings at the sides of the petals are much more delicate than in Pentacrinus, having more the character of striae or crenulation than of coarse ridges. They are also much more numerous than in Pentacrinus, and are limited to the sides of the petals, not reaching the outer edge of the joint-face. Under these circumstances, I suspect that it is to Extracrinus, and not to Pentacrinus, that we must refer the joints which were described by Meek and Hayden as having lance, oval, petaloid areas, "bounded by rather narrow, slightly elevated, transversely crenulate margins."

Extracrinus was proposed by the Austins for the two well-known liassic fossils, Pentacrinus briareus and P. subangularis; but recent investigations have shown that the genus extends up into the great oolite (Bathonien) of Britain, France, and Switzerland. I have no knowledge, however, of any triassic species of Extracrinus; though Pentacrinus is well represented in the St. Cassian beds, and has been found associated with Encrinus in the 'wellenkalk' of Würtemberg.

It is therefore interesting to find that the triassic form of Pentacrinus asteriscus, which was obtained by the fortieth parallel survey from the Dun Glen limestone and the Pah Ute range, differs from the Jurassic specimens found in south-east Idaho and western Wyoming, almost precisely in those points which distinguish Pentacrinus from Extracrinus. According to Hall and Whitfield, the chief distinction of the triassic forms lies "in the more obtuse points of the star, and the filling-up of the angles between the points, and also in the broader form of the elliptical figures on the articulating surfaces of the disks." They suggest that the differences may possibly be of specific value; but, having carefully studied a large variety of stem-joints of Pentacrinidae, both recent and fossil, I am inclined to go farther, and to suspect that the triassic type may belong to Pentacrinus, but the Jurassic form to Extracrinus.

The two genera differ very considerably in the characters of the calyx and arms, as will be fully explained in the report on the Pentacrinidae dredged by the Challenger and the Blake, which will appear in the course of the winter. But, in the mean time, I shall be most grateful for any information respecting Pentacrinus asteriscus, in addition to that which has been already made public; and I need not say that I should much like to have the opportunity of making a personal examination, both of the triassic and the Jurassic specimens. P. HERBERT CARPENTER.

Eton college, Windsor, Eng.,
Aug. 11.

Points on lightning-rods.

The following passage occurs in J. E. H. Gordon's excellent "Physical treatise on electricity and magnetism," vol. i. p. 24: "It was held that the knobs [on the ends of lightning-rods] must be most efficacious, because the lightning was seen to strike them, and never struck the points. The fact that a point prevents the lightning from ever striking at all was not known."

This is not true. The highest rod on my house is some fifteen feet above the others, and about thirty feet higher than the surrounding buildings; and yet, notwithstanding the fact that it is tipped with a brush of five points, it was struck a few years ago. The points are gilded iron, and the topmost one was melted into a ball about one-eighth of an inch in diameter. The rods are all connected by horizontal pieces held about three inches from the tin roof by glass insulators, after the fashion of ignorant lightning-rod agents. The neighbors say that the sparks flew so thickly between the rods and the roof, as to resemble a sheet of flame. The shock was, singularly enough, so slight that it is doubtful whether it was due to the electrical discharge, or the deafening crash of thunder that instantly followed the splitting sound of the spark. A. B. PORTER.

Indianapolis, Aug. 23.

Photographs of the interior of a coal-mine.

One of the most interesting enterprises to which the preparations for the New Orleans exposition have

given rise is the successful attempt to photograph the interior of a coal-mine in Pennsylvania. The mine selected for the experiment was the Kohinoor colliery at Shenandoah, operated by the Philadelphia coal and iron company, from whose representatives all necessary facilities were obtained.

The experiment was conceived of, and successfully carried out, by Mr. James Temple Brown, who was sent out from the metallurgical department of the National museum to collect specimens illustrative of the coal industry. An attempt was first made to photograph by the aid of magnesium light, but the results proved unsatisfactory. The Arnoux electric-light company then volunteered to supply an electric plant, and to erect and take charge of it gratuitously. The five negatives obtained by the use of this light were highly satisfactory, and show some features of coal-mines which probably have not hitherto been seen by scientific men, nor, indeed, by miners themselves, whose feeble lamps give them only a glimpse of the immediate surroundings.

The photographs will be enlarged, and exhibited at the New Orleans exposition. Whatever credit attaches to this somewhat novel undertaking is due primarily to the generous encouragement of the director of the museum, and to the thoughtfulness and energy of Mr. Brown. The representatives of the Philadelphia coal and iron company very kindly gave the matter their personal attention, and the photographer employed for the work labored enthusiastically for the results obtained.

F. W. TRUE.

U. S. National Museum, Sept. 5.

ELECTRICAL TESTING ESTABLISHMENTS.

THE *Electrical review* seconds the suggestion of the *Engineer*, that an 'electrical testing establishment' be founded in England, where any ambitious inventor may find the apparatus and conveniences which he may need for a proper testing and perfecting of his ideas. The *Review* calls attention to the impossibility of a poor man, however ingenious he may be, being able to work upon any improvement in cable telegraphy, as at least an artificial cable must be at his command, — a necessity which would cost him several thousand dollars. In the same way with experiments on electric lamps: the cost of the necessary plant is very considerable, and the amount required for supplies to be used in constant trials is by no means to be neglected.

The founding of such an establishment for the aid of inventors has been suggested by several of the successful members of the class in America, but has not, we believe, been carried out. There would, at the start, be the difficulty of deciding as to the worthiness of any scheme which might be brought forward for development. The inventor is necessarily an enthusiast, and an extremely fickle being, who would come in one morning all aglow for a new form to be given the carbon filament in an incandescent lamp, and the next would have nothing of lamps, but would earnestly urge some peculiar construction of telephone-cable to get rid of the 'cross-talk.' This constant jumping, accompanied by the necessary amount of perseverance, leads him finally to some goal, but at the same time makes him an obnoxious companion to the steady-going workman who must needs follow him, nothing being more discouraging to an artificer than to see the results of his one day's work overthrown on the next.

It may be urged, that the man with capacity for improving the methods of the world's work will sooner or later, but surely, push himself forward into a position where he can help himself through a connection with some rich telegraph, electric-light, or manufacturing company, where his powers will have full play, and his suggestions be listened to and put in effect. It should also be considered whether, in establishing any 'helping-hand' arrangement, the principal or only result would be to assist those for a time who give promise of valuable development, but who are lacking in the strong fibre necessary for successful accomplishment. Notwithstanding all objections, it may appear to some that the possibility of enabling some one worthy man to bring his work to perfection ten, twenty, or thirty years before he could if left to his own unaided resources, would justify the expenditure of considerable sums on what would be found to be the chaff of inventions. What the result might be, is very difficult to say. There might be some very successful work done in such a laboratory, properly guarded, and where the applicants were kept as constantly as might be to their purpose: there certainly would be a vast number of cranks knocking at the door.

The editorial in the *Electrical review* brought