

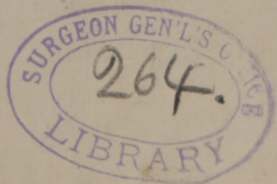
ART. XXI.—Description of the Skull of the Guadalupe Fossil Human Skeleton; by JAMES MOULTRIE, M. D., Professor of Physiology in the Medical College of the State of South Carolina: with introductory remarks; by C. U. SHEPARD, M. D.

My attention was called during the last winter to some portions of a human fossil in the museum of the Literary and Philosophical Society of South Carolina by Mr. JOHN D. LEGARE, by whom I was informed that they were brought from Guadalupe and were undoubted parts of the much valued skeleton in the British Museum, of which so faithful a description was given by Mr. KÖNIG in the Philosophical Transactions for 1814, vol. civ. p. 101. Having received from Mr. KÖNIG many years since a sample of the block in which the skeleton was imbedded, I was able on the first inspection to satisfy myself, that a perfect identity subsisted between the engaging rock in both instances; and on recurring to the paper of Mr. KÖNIG, it appeared that the portions here existing are among those in which the British sample is deficient, viz. the cranial bones and the lower part of a thigh bone. It struck me as being an important inquiry to ascertain if possible from an examination of the shape of the skull, whether the received opinion respecting the Carib origin of the individual were correct; for although the determination of this point, is not likely to carry back the antiquity of the specimen to a very remote period, in opposition to the manifestly recent mineral character of the rock in which it is found, still the result may give it a more ancient date than has been attributed to it, and possibly throw important light on the connection of American races heretofore considered as distinct. I accordingly desired my colleagues, Dr. MOULTRIE and Dr. HOLBROOK, to bestow upon the skull a careful examination, with which request they were very ready to comply. The result as drawn up for publication by the former gentleman, constitutes the following paper.

C. U. SHEPARD.

Charleston, May 30th, 1837.

These precious remains, were brought from Guadalupe by Mons. L'Herminière, a naturalist, and placed (together with many other specimens relating to natural history,) in the museum of the Literary and Philosophical Society of South Carolina in August 1816, from whom it was purchased, (in common with his collection) the succeeding November. They consist of five fragments of dif-



ferent sizes. The largest, is composed of portions of the temporal, parietal, frontal, sphenoidal, and inferior maxillary bones of the right side of the cranium. Saving part of the parietal near the anterior superior angle, the fragment is externally encrusted with the rough calcareous matter in which it was imbedded; while its internal surface being smooth enables us to trace upon it several important distinctive impressions. The temporal portion of this fragment is constituted of the whole of the squamous portion, the greater part of the petrous, and part also of the mastoid. On the first, appears the fossa for accommodating the middle lobe of the brain, marked by its convolutions, and the groove of the middle artery of the dura mater; on the second, the two surfaces, divided by the tentorial ridge, in the anterior of which is the hiatus of Fallopius, and in the posterior, the internal meatus, beyond which the bone is abruptly destroyed; and on the third, the deep, large fossa of the lateral sinus. This portion of the bone also exhibits impressions of the convolutions of the brain; on the lower surface, in like manner appears, the jugular fossa. The parietal bone is defective at its superior posterior part; and the external incrustation is wanting as low down as the parietal protuberance. The bony surface is rendered smooth by the removal of the deposit, exactly where it lies in apposition with this surface. Its internal face shows the marks of the cerebral convolutions, and the arborescent arrangement of the artery before mentioned. The diploic structure and tables of this bone are quite manifest at its irregular edges. The remaining frontal fragments are, the external angle and a small part of the orbital plate—that part of it which is united to the apophysis of Ingrassias. The convoluted phenomena are somewhat apparent here also, and there are faint traces even of the coronal suture. The sphenoidal portion is apparently constituted of a small part of the greater wing, the cerebral surface of which alone is seen in the interstice formed by the temporal, frontal, and parietal divisions, composing the middle fossa. Towards the under side, imbedded within the calcareous crust, are two spots of cancellated appearance, which are probably the remains of the pterygoid process, and the alveolar edge of the superior maxillary bone which is in immediate contact with it.

The next in size is the occipital portion; the right half, separated from the left, by a vertical section passing through the middle of the bone. It is covered externally with the common crust, but is designated interiorly by the crucial ridge, part of the occipital



foramen, the depressions of the lateral sinus, and the fossæ of the posterior lobe of the cerebrum, and of the cerebellum. Near the outer side of the occipital foramen, is the curved fossa of the lateral sinus, usually found just where that conduit is about to emerge from the cavity of the cranium. The diploic structure and tables are here also quite obvious at the vertical edge of the fragment.

Next, is the portion which may be taken for either a parietal or frontal fragment. I think it the latter, because, internally, it wants the arborescent features characterizing the lower half of the parietal bone, and is equally deficient in traces of the fossa of the longitudinal sinus declaratory of the upper; and with respect to uniformity of smoothness, and configuration, corresponds more closely with this bone than with the other.

The next is undoubtedly the mental portion of the inferior maxilla. This is indicated by its thickness, curvilinear figure, and the character of the alveolar processes and sockets; by the triangular tubercle at the bottom of the symphysis in front; and the mental tubercle and lateral fossa of the right digastric muscle behind; besides that the alveolar edge is sharp; the sockets, which are six in number, are single; and what is considered to be the base exhibits, very evidently, the usual close cellular conformation.

The last is obviously a part of the superior posterior angle of the parietal portion. It is the smallest fragment, and needs no particular description.

These relics have been supposed to belong to the head of an individual of the Carib race. This is undoubtedly a mistake. The anterior posterior diameter is too short, the occipital region too flat, and the lateral and vertical developments too full, upon a reconstruction of the cranium, to justify such a supposition. The following are the admeasurements, made jointly by Prof. Holbrook and myself. From the posterior edge of the occipital foramen to the concavity of the frontal bone behind the frontal sinus, five inches. From the same to the anterior superior angle of parietal bone, four inches and eight tenths. From the fossa of Sylvius to the same point, four inches and a half. From the center of the petrous ridge to the center of the cerebellar fossa, one inch and five tenths; and from the same center to the cerebral fossa, or the fossa of the posterior lobe of the cerebrum, two inches and one tenth. Compared with the cranium of a Peruvian, presented to Prof. Holbrook by Dr. Morton, in the museum of the Medical College of the state of South Carolina,

the craniological similarity manifested between them is too striking to permit us to question their national identity. There is in both, the same coronal elevation, occipital compression, lateral protuberance accompanied with the frontal depression, which marks the American variety in general. Insomuch that were it possible to exfoliate, if I may so say, the fossil relics from their incrustation, the vacancies might be filled with the corresponding parts taken from the head of the Peruvian. Placing the maxillary fragment in apposition to the corresponding opposite alveolar row of this head, the physiognomy is such as to lead the imagination to view it as a fac simile of the original.

JAMES MOULTRIE.

#### MISCELLANIES.

##### DOMESTIC AND FOREIGN.

1. *Annual Report of the Curators of the Boston Society of Natural History.*—Read at the Annual Meeting, May 1st, 1837; by D. HUMPHREYS STORER, M. D.

Your committee to whose duty it has fallen to report upon the state of the cabinet, takes great pleasure in congratulating the society upon its unprecedented prosperity. At no previous period have so many additions been made to our collections; or so much labor been bestowed by the curators upon their respective departments. Our hall has become a favorite resort for the community at large, and the naturalist finds here rich materials for study and improvement.

The number of donations the past year is one hundred and sixty, the number of donors one hundred; of these, we cannot refrain from mentioning the names of Mrs. A. A. Shattuck and Mrs. Thomas Say, and those of Messrs. Amos Lawrence, B. D. Greene, S. A. Elliott, David Eckley, Geo. B. Emerson, G. C. Shattuck, G. C. Shattuck, Jr. Wm. Ingalls, George Parkman, Charles Amory, Professor Hitchcock, Horace Gray, James Jackson, Francis C. Gray, Jonathan Phillips, John Randall, David Henshaw, J. J. Dixwell and J. B. Higginson.

The principal donations to the several departments, are as follows:

*In Mineralogy and Geology.*—A beautiful specimen of opalized wood from Hobartstown, S. S. Volcanic specimens from Fayal



and stalactites from Ohio; but far more interesting than these, several original specimens, together with a series of casts, of the newly discovered ornithichnites or bird tracks of Professor Hitchcock, have been added to our cabinet.

The members of the society are well aware why so little attention has been paid to enriching this portion of our collections. All the cases appropriated to mineralogy, are filled with the valuable deposit of Dr. C. T. Jackson. It is however very desirable that the cabinet strictly belonging to the society, should be enlarged, that we may be prepared to supply the vacancy which would be produced by the removal of the collection before us.

*Botany.*—Although no addition of importance to the botanical department has been made during the last year, save a suit of plants collected in the neighborhood of Savannah, and presented by Mrs. Thomas Say, perhaps no portion of our collection has received more attention, or is becoming more rapidly, and at the same time, more thoroughly arranged, than this.

*ZOOLOGY.*—1. *Mazology.*—Previous to the last annual meeting, the body of an elephant weighing upwards of six tons was purchased by the subscription of several of our members. The time and labor required to prepare it for exhibition, prevented its addition to our collection many months since. Several gentlemen assisted in the dissection of the body; to our cabinet keeper alone, however, we are indebted for the completion of the perfect skeleton which ornaments our hall.

2. *Ornithology.*—The exceedingly curious and rare nest of the *Ploceus Phillipensis*; the eggs of a few of our birds; and a valuable collection of birds' skins, from India, from J. J. Dixwell, Esq. to whom the society have been previously greatly indebted, are the principal additions to our ornithological department. This portion of our collection now contains several hundred species, of carefully preserved valuable foreign birds. But we are compelled to add, in the *species of our own state*, the deficiency is very great. Singular as it may appear, that department of our natural history, the means of acquiring a knowledge of which are most ample, and within the reach of all; whose objects are most generally known, and all of which have been accurately and scientifically described, which are interesting not merely to the naturalist, but claiming alike the attention and admiration of the cursory observer, this department which might be made most beautiful, and as its species can *each* be procured, most valuable, has been unpardonably neglected.

Less than three hundred species of birds are found in Massachusetts. A specimen of each species might be procured and mounted for three or four hundred dollars, and yet there are our cases, empty.

3. *Herpetology*.—Several species of serpents from Brazil, and Mississippi, and a choice collection of reptiles from India, have been added to the herpetological cabinet.

4. *Ichthyology*.—With the exception of a beautiful specimen of *Lepisosteus* from the Ohio river, presented by Dr. Emerson of Illinois, no additions, save a few of our own fishes, have been made to the collection of ichthyology. It would ill become your curator of the departments of ichthyology and herpetology to dwell upon this portion of his report: justice to himself however, requires he should remark in passing, that the pledge referred to by the gentleman who offered the last annual report, has been redeemed, and the reptiles, as well as the fishes, are scientifically arranged, labelled and catalogued.

5. *Entomology*.—To no department can we point with more pleasure or pride, than to that of our entomology. Each succeeding year has added new treasures to the cabinet, until it has become by far the most extensive and valuable in the United States. The following extract from an elaborate report kindly offered me by the curator of this department, will undoubtedly be gratifying to the society. “At the annual meeting in May, 1836, Dr. Gould reported the condition of the cabinet of insects, and the additions and donations which had been made to it. All the *diurnal* Lepidoptera were then arranged and named, and some progress had been made in arranging, determining and labelling the Coleoptera. About one half of the insects of this order are now finished, their names as far as they could be ascertained are affixed to them, and the species are arranged and referred to the new genera according to the catalogue of Count Dejean. The number of species now entered upon the catalogue amounts to two thousand one hundred and eighty, and when the remainder are added, the cabinet will contain at least two thousand and six hundred species of Coleoptera, without including those in the collection of Professor Hentz.

“The processes necessary to be gone through with the insects renders the work very slow and tedious. Many of the insects require to be cleaned; a large number are badly impaled, upon short, clumsy or crooked pins, and must therefore be softened so as to have these pins extracted and new ones inserted, and this delicate and hazar-



dous process requires no little skill and patience in the execution ; they are then to be determined, labelled and fixed in a box in order to be baked, an operation essential to their future preservation ; and lastly they are to be placed in proper order in the drawers where they are to remain, with the names of the families and genera affixed to them.

“ The drawers in which the Lepidoptera and Coleoptera are contained, I have supplied with strips of soft pithy wood to receive the pins of the insects ; but having exhausted my supply, in preparing the drawers in the cabinet of the society, I have been obliged to suspend my labors until the remaining drawers shall be prepared in the same way ; for experience has taught me the necessity of having the drawers lined entirely, or partially, at least, to receive the slender pins used for insects and render them safe in their places.

“ The additions to the cabinet of insects during the past year consist of one box of Chinese insects, and one double box containing specimens from South America, both presented by Col Baker : nineteen specimens in spirit from Calcutta, presented by Mr. Dixwell : one hundred and fifty one specimens from the Cyclades and Marseilles, presented by Mr. Richards : one small box of specimens packed between layers of paper, collected in the island of Syra, and presented by the Rev. J. J. Robertson : and a box of Swedish Coleoptera, containing two hundred and forty one specimens from Mr. Fabræus of Gottenburg, sent for exchange through Dr. J. S. Copley Greene, in return for which, an equal number of specimens has been selected from our duplicates and sent to Mr. Fabræus.

“ Mr. W. W. Wood of Manilla, from whom the society received, during the last year, three boxes of exceedingly valuable insects through the kindness of Mr. Russell, has in reply to a letter from me, offered to collect and send to us more insects from the Phillippine islands, if we will furnish him with boxes, pins and camphor ; and I would recommend the society to embrace his liberal offer, and supply him with the means of executing it.

“ Dr. Zimmerman, the author of a work on the Carabidæ, when here on a visit from the South, during the last summer, received from Dr. Gould and myself a large collection of the duplicates belonging to the society, in return for which he promised to send an equal number of species from the Cape of Good Hope, and other countries, the entomology of which is not yet represented in our cabinet.

“On the 18th of June, 1836, there arrived from New Orleans, the collection of Professor Hentz, sent to us in consequence of a negotiation with me for the purpose by subscription of this large and valuable collection for our society. If no mistake has been made in counting the insects there were fourteen thousand one hundred and twenty six specimens, one thousand three hundred and fifteen of which are foreign insects, leaving *twelve thousand eight hundred and eleven native insects*. Many of these are duplicates, but not the less valuable to the society on this account. They have already furnished us with specimens to return to Mr. Fabræus, in exchange for the insects received from him, and I have sent also a few of them to Mr. Schönherr for their names, and with the request that he would honor us with insects in exchange for them.

“There were several boxes and drawers in Mr. Hentz’s collection very closely filled with insects of all orders promiscuously mixed together. These it was desirable should be assorted and incorporated with the others. In fact, it became absolutely necessary to select the Coleoptera without delay, to enable me to make a proper choice of specimens to be used in making exchanges. Accordingly, when obliged to suspend my labors on the cabinet of the society, for the want of drawers properly prepared to receive the insects, I began to assort the miscellaneous collection received from Mr. Hentz, and proceeded with all possible expedition until they were transferred from the boxes and drawers in which they came, to their proper places in the other part of the collection. *All the Coleoptera* received from this gentleman have been carefully examined, and are arranged in a regular series, according to the catalogue of Count Dejean. It will be comparatively an easy task hereafter to transfer these Coleoptera and unite them with the general collection of the society, should this be deemed advisable. I propose next, to arrange the insects of the other orders in a similar way.”

6. *Conchology*.—Valuable accessions have been made during the past year, to our cabinet of shells. Several individuals have presented most acceptable donations.

Many specimens of foreign shells from Mr. Couthuoy—as uite of fresh water bivalves from the Ohio, from Dr. Ward of that state—and a large collection of East India shells from J. J. Dixwell, Esq. are most worthy of notice.

These additions, however, are not all which have increased the value of the collection. Much labor and study have been devoted



to their classification; and although containing at the present moment 153 genera, and 1700 species, the names of 1200 species have already been ascertained.

This is the largest public collection of shells in the Union, and adds more than any other department to the attraction of our museum.

7. *Zoophytes*.—Although no very great additions have been made to the collection of Zoophytes, we should not forget to mention a very beautiful foreign scutella, presented by Dr. T. W. Harris; a large mass of sponge attached to the madrepore, upon which it grew, from the Red Sea, presented by J. A. Lowell, Esq. and a valuable collection of corals from the East Indies, presented by J. B. Higginson, Esq.

The number of species now in our entire collection is as follows.

*Mineralogy and Geology*.—About seven hundred specimens.

*Botany*.—Several thousand species of plants, besides fruits, &c.

*Zoology*.—*Mammalia*.—Thirty whole skeletons; among these, those of the *Simia satyrus*, *Cebus fatuellus*, *Hylobates fuscus*, *Erinaceus Europæus*, *Talpa Europæa*, *Elephas Indicus*, *Rhinoceros Indicus*, *Tapir Americanus*, *Hydrochærus capybara*, *Cervus elaphus*, *Antilope dorcas*, *Didelphis Virginiana*, *Mustela lutreola*, &c. &c. Thirty crania, some of which, are those of the *Felis tigris*, *Sus scropha*, *Sus babirusa*, *Cervus Virginianus*, *Equus caballus*, *Mephitis putorius*, *Canis familiaris*, *Felis catus*, *Sciurus cinereus*, &c. &c. besides many beautiful horns, and antlers; those of the *Cervus alces*, *Cervus Canadensis*, *Antilope furcifer*, *Antilope rupicapra*, *Antilope strepsiceros*, *Antilope gazella*, *Antilope mhorr*, *Antilope gnu*, *Bos bubalus*, var. *Bos arni*, should not be passed by unnoticed.

*Birds*.—Whole number mounted, fifty six. Several hundred; not mounted.

*Reptiles*.—Ninety genera—one hundred and thirty species.

*Insects*.—About fifteen thousand species.

*Shells*.—Upwards of seventeen hundred species.

*Crustacea*.—One hundred and thirty species.

*Radiata*.—One hundred and ninety species.

*Library*.—The Library contains about 600 volumes.

The most valuable additions which have been made to it the past year, are a memoir on the *Nautilus pompilius*, Audubon's *Ornithological Biography* and a set of the original plates to Abbott's birds

of Georgia, from individual members; and the magnificent plates to Audubon's Ornithology, and the invaluable works of Olivier and Voet, presented by subscription. The former of these donations, are too well known to require a single remark; of the latter works, the curator of Entomology observes in his report upon Mr. Hentz's collection, of which they made a part, "it is hardly necessary to advert to the works of Olivier and Voet, which came with the insects. They are adorned with numerous plates, engraved by the best artists of the day and beautifully colored. The work of Olivier is in 10 volumes quarto, splendidly bound in calf and gilt; that of Voet in 4 vols. quarto, is in fancy boards, but the plates are even superior to those of Olivier's work. There is in the College library an imperfect and incomplete copy of Olivier's work, with uncolored plates, and in the library of the Academy of Natural Sciences of Philadelphia both of these works are to be found. These are, as far as I know, the only ones in the country—they are rarely to be obtained in Europe, and then only at a high price and some risk to the importer."

*Communications.*—Besides many verbal reports of great interest, twenty four written communications have been presented the last year by the following gentlemen, on the following subjects.

*C. T. Adams.*—The changes produced upon Mt. Holyoke by the effects of diluvial currents.

*Amos Binney.*—On several new species of shells in the cabinet of the society and on the Helices of the United States.

*T. M. Brewer.*—On the catalogue of birds in Professor Hitchcock's Report, and a review of George Ord's paper in Loudon's Magazine of Nat. History, on the habits of the Cow-bunting.

*J. P. Couthuoy.*—Report upon a new shell from New Holland, a new species of Marginella, and a new species of Tritonia.

*E. S. Dixwell.*—Upon the luminosity of the sea.

*A. A. Gould.*—A report upon craw fish.

*T. W. Harris.*—On the Biche du mer, on the nest of the Placens Phillipensies, and on the Meadow mouse.

*C. T. Jackson.*—Upon the coal mine at Mansfield: upon an analysis of three species of water from the Azores.

*J. B. S. Jackson.*—On the anatomy of the Testudo elephantopus, and on the anatomy of the genital organs of the horse.

*D. H. Storer.*—A report upon the Blennius physis, on a new species of Gasterosteus, on a new species of Marginella, and on a new species of Hydrargira.



Three years since, an effort was made to establish a journal containing papers upon Natural History read at the meetings of the society; and the first number was published. Its limited circulation rendered it inexpedient that the society should be longer responsible, and the expenses of the numbers published the two succeeding years, were liberally met by two of our members. It gives us great pleasure to add, that since the last annual meeting, a sufficient number of subscribers have been procured to meet the expenses of a *fourth*, which is now in course of publication; and that in future, our journal will appear more frequently.

The *committee of publication*, confidently look to the members generally, for countenance and support: they would use their utmost endeavors to make their publication alike creditable to the society and New England. While the societies of other cities in the Union are continually adding something new to the treasures of natural science, we should not be left in the course.

Mortifying indeed it is, to look over the catalogue of the natural history of our state, and not see a single bird, or fish, or reptile, or mollusk, associated with the name of an acting member of this society. *By others, they have all been made known. Much however remains undone.* Hundreds of our plants are unknown to naturalists:—the habits of many of our birds, and reptiles and fishes, are imperfectly understood: the list of our Crustacea and Radiata remains to be greatly enlarged; of the 2300 insects catalogued in Professor Hitchcock's report, *more than 1100 are new*; and by whom can they be better described, than by the *author* of that catalogue?

Disappointed in having no annual address, the gentleman who drafted the report the last year, added much to its value, by making an analysis of several of the written communications which had been read at the regular meetings of the society. Although many of the papers which have been presented since then, are of peculiar interest, and to offer the substance of which, would be most grateful to the feelings of your committee, he is reminded that by pursuing this course at the present moment, the report would encroach upon his time,\* who is far better able to interest and instruct you, than he who has thus cursorily glanced at the progress of the society, since our last annual meeting.

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\* Rev. Hubbard Winslow—the anniversary orator.

2. *Crosse's Galvanic Apparatus*.\*—The public attention having been much excited by the unpretending statements of Mr. Crosse at the late Bristol meeting, and with the remarkable effects produced by a galvanic apparatus the most extensive of any that has ever been erected, at least by a private individual, we doubt not that the following letter addressed to the editors of the London Mining Journal, by a gentleman so well known in science as the writer, (together with the article which immediately follows,) will be acceptable to the readers of our Journal.

TO THE EDITOR OF THE MINING JOURNAL.

*Sir*—Some questions having appeared in your recent numbers, concerning the construction of the galvanic apparatus of Mr. Crosse, I am happy in having it in my power, from having spent some interesting days in his house, to give your correspondents an account which I hope may prove satisfactory. I rejoice in the opportunity thus afforded me of showing, that although locally removed, I can never cease to feel a warm interest in what is passing in a county endeared to me by so many associations. Each separate combination, forming one of the members of Mr. Crosse's galvanic series, consisted of a plate of copper, containing from three to four square inches of surface, bent round so as to form a cylinder, inside of which was a similar plate of zinc; round the interior zinc cylinder a thin string was coiled spirally, to keep its surface, throughout, separate from that of the exterior copper cylinder—these metallic cylinders, were, in about a quarter of the series, placed in glass cylindrical vessels, just large enough to contain them, and filled with water; but, in the greater number, the external copper cylinder being soldered and closed at the bottom, so as to hold water itself, the glass containing vessel was dispensed with. When this was the case, the metallic cylinder was separated from the table on which the apparatus was placed, by the intervention of a small square of common glass, a little broader than the diameter of its base; this was done to secure the insulation. These cylinders were arranged into a series, in the usual form, by copper arches passing from the copper cylinder of each combination to the zinc cylinder of its neighbor. The apparatus when I saw it, just after the late Bristol meeting, was composed of eight hundred such cylinders, disposed in continuous lines, so arranged as to occupy the least room. Its effects, though excited with water only, were very powerful. I should say, equal to those

\* From the Franklin Journal for April, 1837.



ordinarily produced by about one third of the same number of galvanic combinations of equal surface, excited by acid—considerable lengths of thin wire were fused, &c. A common electrical battery of great size, containing seventy feet of coated surface, was charged in a single instant, if connected with the wires proceeding from the extremities of the galvanic series; and when successive discharges were, under these circumstances, taken from the electrical battery, the effects were most intense. After receiving three or four such discharges on the point of my pen knife I found, on examining it with a glass that its extremity had been completely fused. I need not dwell on the extreme importance of having constructed an apparatus capable of producing such powerful effects, when excited by water only; the excitation by acid is violent at first, but goes on rapidly decreasing, and at the end of three hours becomes almost null. If it were attempted to sustain an uniform action, by the continual affusion of fresh acid, the zinc plates would be entirely corroded in a very few days; indeed, the constant attendance necessary, and the enormous expense, would render such an attempt practically impossible. But in Mr. Crosse's apparatus, though excited by water only, we have a strength equal to very large ordinary troughs, say three hundred plates, and that strength is uniform and permanent, and requires no further attendance than replenishing the water, (from the loss sustained by evaporation,) once in six weeks; in this mode also, the corrosion is so slow, that the same apparatus might probably last for twenty years; much of it has already been in constant action much more than a year, and does not seem in the least impaired. The importance of imitating nature, by keeping in constant and uniform activity such powerful galvanic currents, must be obvious. Besides the series I have described, Mr. Crosse had begun to construct one of much larger dimensions; each cylinder containing a square foot in surface. Should he proceed with equal vigor we may expect some day to hear of two thousand of such cylinders; the effects must then be almost terrific. Could we, inquisitor-like, put nature to the question, by so efficient an instrument, she could hardly resist any interrogatories we might please to put to her, and all the mysteries which at present perplex us in chemistry might be expected to stand revealed. I should regard the completion of such an apparatus as quite a national object; and I feel convinced, that it is by proceeding in this line that we may best hope to see the force of electricity practically applied as a moving power, and the energy

of lightning bent, like that of steam, into subserviency to the purposes of human art. I remain, Sir, your obedient servant,

W. D. CONYBEARE.

3. *Accidental Production of Animal Life*; by MR. CROSSE.—A communication from Mr. Stutchbury, of the Bristol Institution, has been disseminated through the public journals, of which we give a copy. As there is no doubt of the honor and veracity of Mr. Stutchbury, the extract which this gentleman gives from a letter of Mr. Crosse, may be considered as if communicated by Mr. Crosse himself.

*Sir*—It may be truly said that facts recorded, faithfully detailed, and made public, are the means by which philosophy is enabled to render her temple more durable on its foundations—every additional fact being the commencement of that which, when understood, forms an outwork of defence, rendering the interior the strong hold and sacred depository of truth.

It was a maxim of the late John Hunter, which he was repeatedly proclaiming, that greater benefit would be conferred upon the community if professional men had the moral courage to publish detailed accounts of all their unsuccessful cases, than could be derived by the publication of those which met with a favorable termination, for then the physician would reject at once such as had failed as modes of cure, without repeating experiment after experiment, thereby saving much valuable time, and certainly sparing much needless pain to the unfortunate patient. So with facts in natural philosophy. Let experiments be recorded, and their results will enable others, either to avoid, or successfully to pursue them, so as to bring them to bear upon principles which may elucidate some great truth, the light of which would probably have never shone upon them, had they not been able to take advantage of the works of pioneers who had proceeded, perhaps, to the very threshold of the same result.

With regard to a large number of curious and (at the same time, in consequence of the principle not being understood) astounding facts, the investigator would be doing a great injury in the cause in which he labors, should he be deterred from making them known, merely because he cannot at the same time reasonably account for the same. And upon this view of the subject, and to set at rest the vague views which are abroad, I feel it a duty due to the cause in which I am engaged, and to the philosopher with whom they have originated, at



once to take the liberty of transmitting to the press, and particularly the local press, from which so many reports have emanated, an abstract of a letter I have received from Mr. Crosse, with an account of his experiments, in the language of a private communication, (not that which he would probably have chosen, had he made the communication himself,) and without further comment.

“The following is an accurate account of the experiments in which insects made their appearance:—

“*Experiment first.*—I took a dilute solution of silicate of potash, supersaturated with muriatic acid, and poured it into a quart basin, resting on a piece of mahogany; a Wedgwood funnel was placed in such a manner that a strip of flannel, wetted with the same, and acting as a siphon, conveyed the fluid, drop by drop, through the funnel upon a piece of somewhat porous Vesuvian red oxide of iron, which was thus kept constantly wetted by the solution, and across the surface of which, (by means of two platina wires connected with the opposite poles of a voltaic battery, consisting of nineteen pair of five-inch plates in cells filled with water and  $\frac{1}{500}$  muriatic acid,) a constant electric current was passed. This was for the purpose of procuring crystals of silex. At the end of fourteen days I observed two or three very minute specks on the surface of the stone, white, and somewhat elevated. On the eighteenth day, fine filaments projected from each of these specks, or nipples, and the whole figure was increased in size. On the twenty-second day, each of these figures assumed a more definite form, still enlarging. On the twenty-sixth day, each assumed the form of a perfect insect, standing upright on four or five bristles which forms its tail. On the twenty-eighth day, each insect moved its legs, and in a day or two afterwards detached itself from the stone and moved at will. It so happened that the apparatus was placed fronting the south, but the window opposite was covered with a blind, as I found these little animals much disturbed when a ray of light fell on them; for out of about fifty which made their appearance at once, at least forty-five took up their habitation on the shaded side of the stone. I ought to have added, that when all the fluid, or nearly so, was drawn out of the basin, it was caught in a glass bottle, placed under a glass funnel which supported the stone, and was then returned into the basin without moving the stone. The whole was placed on a light frame made for the purpose. These insects have been seen by many of my friends, and appear, when magnified, very much like cheese-mites, but from twice

to eight times the size, some with six legs, others with eight. They are covered with long bristles, and those at the tail, when highly magnified, are spiny. After they had been born some time they become amphibious, and I have seen them crawl about on a dry surface.

“*Experiment second.*—I took a saturated solution of silicate of potash, and filled a small glass jar with it, into which I plunged a stout iron wire, connected with the *positive* pole of a battery of twenty pair of cylinders, filled with water alone, and immersed in the same a small coil of silver wire, connected with the *negative* pole of the same battery. After some weeks’ action, gelatinous silex surrounded the iron wire, and, after a longer period, the same substance filled up the coil of silver wire at the other pole, but in much less quantity. In the course of time one of these insects appeared in the silex at the negative pole, and there are at the present time not less than three well-formed precisely similar insects at the negative, and twelve at the positive pole, in all fifteen. Each of them is *deeply* imbedded in the gelatinous silex, the bristles of its tail alone projecting, and the average of them are from half to three quarters of an inch below the surface of the fluid.

“In this last experiment we have neither *acid*, nor *wood*, nor *flannel*, nor *volcanic iron-stone*. I will not say whether they would have been called to life without the electric agency or not. *I offer no opinion, but have merely stated certain facts.*”

In addition to this, on Friday, the 10th ult., Mr. Crosse transmitted to Mr. Owen, Hunterian Professor, College of Surgeons, London, a copy (perhaps the original) of the above, in his own hand-writing, with several specimens of the insects themselves, so enclosed in Canada balsam and between plates of glass and talc, as to be easily submitted to examination in the microscope. By the kindness of this gentleman, Mr. Clift, conservator of the museum, in the same establishment, produced them at the *Conversazione* of the Royal Institution on Friday, the 17th, when they were most satisfactorily visible in the microscope. By an extension of the same courtesy on the part of Mr. Owen, we have been permitted to draw and engrave two of the groups of these mysterious visitors, in order to gratify the prevailing intense desire for accurate information upon the subject.