surface is decayed as if no removal or grinding of the surface material had taken place by glacial action, and is entirely free from drift boulders. As a probable explanation the author suggested that this area lay to leeward of a great ice ridge which effectually shielded it from the direct action of the glacial ice stream.

Mr. H. B. Humphrey detailed his observations upon the influence of low temperatures upon plants, and described the difference of effect of sudden changes and gradual lowering of the temperature. Living specimens kept for a month or more in commercial cold-storage rooms at a point slightly below freezing exhibited phenomena of starvation.

CHARLES P. BERKEY,
Corresponding Secretary.

MINNEAPOLIS, MINN.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

AT the meeting of the Academy of Science of St. Louis of April 3d a paper by Mr. Stuart Weller, entitled 'Kinderhook Faunal Studies, I: The Fauna of the Vermicular Sandstone at Northview, Webster county, Mo.,' was presented for publication; and Mr. Trelease exhibited a plaster cast of a gigantic monstrosity of *Cereus marginatus*, known as the Rosa de Organo, presented to the Missouri Botanical Garden by Professor Frederick Starr, and reported that this formation was locally abundant at points south from Aguas Calientes. The speaker exhibited a large number of comparable cactus monstrosities from the plant-houses of the Missouri Botanical Garden and the collection of the President of the Cactus Association of St. Louis, and a similar deformity of one of the cactus-like Euphorbias of the African region, commenting on this teratological type. It was shown that for the purposes of gardeners, for whom these unusual forms appear to possess a considerable interest, they are commonly divided into two types, in one of which, commonly designated by the varietal name cristata or cristatus, the monstrosity takes the form of a fan or a contorted ridge, while in the other, commonly designated by the varietal name monstrosa or monstrosus, it consists of irregular bunching of the branches and an interruption of the customary longitudinal ridges of such a genus as *Cereus*.

WILLIAM TRELEASE,
Recording Secretary.

BOSTON SOCIETY OF NATURAL HISTORY.

A GENERAL meeting was held March 15th; twenty-eight persons present.

Mr. E. C. Jeffrey, in an account of the genus *Equisetum*, stated briefly the sexual and asexual methods of development. The internal structure of the stem was described, and the relationships of the Equisetæ to the Lycopods and ferns were noted. Structurally Archæocalamites resembles the higher Lycopods. The branches of Calamites originate from the center of the ring of nodal wood or from its lower border. Casts of Calamites show pith.

Dr. C. R. Eastman read a paper on some new North American fossil fishes. An abstract will appear in an early number of SCIENCE.

SAMUEL HENSHAW,
Secretary.

DISCUSSION AND CORRESPONDENCE.

ON THE ACTION OF THE COHERER.

EXPERIMENTS have been made at the physical laboratory of the Missouri State University which show that the action of the Branly tube is due to an actual cohering of the particles. The action consists, first, in an electrostatic attraction causing the particles to come in contact, and second, in a fusion of the points of contact.

An instrument has been designed and constructed which clearly shows this coherence and renders its study possible. It consists of two electrodes, one a metallic plate on which the filings are placed, and the other a metallic point carried on a pivoted arm swinging in a vertical plane. If a considerable difference of potential is maintained between these electrodes, and the point be brought in contact with the filings and then carefully lifted, a thread will attach itself to the point and may be drawn out to two or more inches in length. The difference of potential has, in our experiments, been produced in a variety of ways. Thus the instrument was placed in circuit with two dry cells and a 160-ohm relay, and threads

produced. Here the effect was caused, not by the low potential of the battery current, but by the much higher potential of the extra current produced by the constant breaks at the lower end of the thread. This was demonstrated by placing a non-inductive resistance of about 1,000 ohms in parallel with the coherer. This entirely prevented the action. Attaching the ends of the secondary of an induction coil to the coherer gave similar results, as did also the Holtz machine.

But these threads remained cohering after there had ceased to be a difference of potential between the electrodes. In a vacuum the threads still remained hanging, showing that the friction and pressure of the air did not maintain the coherence. Under the microscope the points of contact appear to be fused, and other observers have noticed bright points after coherence is destroyed. That fusion occurs is also shown by the fact that metals having a high melting point give threads of much less tenacity than those with low melting points. Thus platinum and iron give very fragile threads, while tin, lead and aluminum give threads capable of enduring considerable flexure.

With the Holtz machine threads could be produced only when the machine was run slowly. If it was run too fast the particles would fly back and forth between the electrodes of the coherer. The point of the coherer, becoming charged, induces a charge in the particle nearest to it. This causes an electrostatic attraction, the particle flies to the point and, receiving a like charge, is at once repelled. But the instant it comes in contact the points of contact fuse, and if the charge on the electrode be small this fusion will be sufficient to resist the tendency to fly off and the filing will remain, becoming a part of the electrode and repeating the action on the next particle. Thus consecutive filings are united and a continuous thread of filings fused together, which connects the electrodes, reducing the resistance greatly. In a Hertzian field the action is precisely similar, the difference of potential here being produced by the action of the Hertz waves. Short threads of filings were obtained, as in the preceding experiments.

These experiments show that the great reduction in the resistance of the tube is due to the formation of continuous threads of metal connecting the electrodes. They also indicate some of the points which a good coherer must possess. The filings used should be composed of metal not easily oxidized, of small specific gravity and low melting point. The electrodes should consist of points or roughened surfaces of similar metal. Further, it is difficult to decohere a thread while a current is flowing, since the induced current at any break tends to bring back the parts to coherence. Marconi avoids this action by the use of a high resistance in parallel with the coherer. The necessity for this resistance can be avoided by having the current through the coherer broken before the tapping occurs. Experiments are being continued in the direction of a practical application of these principles.

M. H. LOCKWOOD,
E. B. WHEELER.

MARCH 30, 1899.

TWO-HEADED SNAKES.

TO THE EDITOR OF SCIENCE: I am engaged in the study and description of two-headed snakes by means of skiagraphy. Although I have in hand eight specimens from various museums, I have been unable to locate the Tropidonotus from the Massachusetts State Collection, described by Wyman in the *Proc. Bost. Soc. Nat. Hist.*, Vol. IX., p. 193, and the three snakes described by Mitchell in the *Amer. Jour. of Science*, Vol. X., p. 48.

I write in the hope that one of your readers may be able to help me in my quest of these four specimens, and that I may be informed of any other snakes with this abnormality in American collections, in order that I may make note of, or describe, them in my forthcoming paper.

ROSWELL H. JOHNSON.
1727 CAMBRIDGE STREET, CAMBRIDGE, MASS.,
April 14, 1899.

DUPLICATION OF GEOLOGIC FORMATION NAMES.

IT was not my intention, in my letter in SCIENCE of March 31st, to discuss the question as to whether certain names of geologic formations conflicted, or to discuss the undesirability of