contempt. The tail of a whale is no wise more complicated structurally, nor a whit more interesting morphologically, than the sting of a bee; but it occupies an infinitely greater space, and is more obvious both to the gaze of the curious and the study of the competent, — a fact which the management of a popular museum cannot afford to ignore.

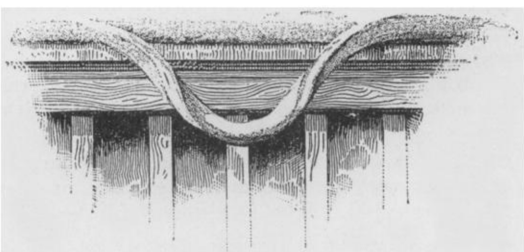
The national museum has very properly developed most in those departments, like ichthyology, geology, and ethnology, which receive, independently, government aid, and thus furnish both workers and material. If some of the other departments have so far been left without material support, those persons feel least like complaining who are familiar with the ultimate intentions of the director and his efficient assistant, and with the vast amount of work accomplished in organization and installation since the building was completed. C. V. RILEY,

Hon. curator of insects, U.S.N.M.

Washington, D.C., Feb. 12.

Plastic snow.

A phenomenon new to me was observed at the close of the north-east storm this noon, which showed the cohesive force in wet snow. The railing to my porch has a top sloping about ten degrees each way. My attention was directed to a festoon of snow sixteen inches and a half between ends, and seven inches deep, formed from a snow-ribbon. As it left the railing, it was gradually twisted, so that the bottom of the loop was in a position the exact reverse of what it had held when upon the rail. The twist-



ing-force had extended for a number of inches in each direction in the part that remained upon the rail. This loop hung free, and moved over an arc of five or six degrees when the wind struck it. It was of short duration, as the water from the rail melted the centre; and the ends, as they swung back, were broken off about four inches from the rail, and showed a spiral twist like that in a twist-drill. On the next panel was the end of a former loop; and this hung free, and measured nearly ten inches in length. EDWARD H. WILLIAMS, Jun.

Bethlehem, Penn., Feb. 16.

Hereditary malformation.

Mr. E. Brabrook writes to the society of anthropology in Paris an account of hereditary hypospadias, first reported to the *Lancet* by Dr. Lingard. The order of inheritance is as follows: first generation, one affected; second, one; third, one, whose widow afterwards married a man unaffected. This woman had seven sons — three by her first husband, and four by her second husband — all affected. I will divide these seven sons into the first and second set. Of the first three, one died childless: the other two had six sons, all affected. Of the second set were born eleven sons, — four affected, and seven unaffected. Three sons are reported of the first set in the next or sixth generation, two of whom are affected; while, of three sons belonging to the second set in the same generation, none are affected. Aside from the great value of such a compact series of well-authenticated facts, a very interesting question, often mooted among stock-breeders, of the permanence in the effects of first impregnations, receives here a partial answer. The running-out of this influence in a few generations should also be carefully studied. I do not speak of the transmission of hereditary traits of the male through the mother, because Dr. Lingard does not seem to have looked among the female descendants for co-ordinated malformations. OTIS T. MASON.

The Georgia wonder-girl and her lessons.

I read with no little interest the article with this title which appeared in this journal on Feb. 6.

I was privileged to make a private examination of Miss Lulu Hurst, the person referred to in the article, on several occasions, in the presence of her parents, and usually of her business-manager. On one occasion I was permitted to make a careful examination of the subject's physical development, and take notes upon her normal temperature, heart-beat, and respiration. I found her to be a healthy, intelligent country-girl, *plump* rather than muscular, presenting nothing very unusual in her constitution; and I certainly did not note the fact that I might be shaking hands with a 'giant.' The muscles of her arm and fore-arm were *not* unusually developed; nor did they stand out prominently, as they do in muscular subjects of either sex. She is above the average stature for women, but does not strike one as being either exceedingly active in movement or overpowerful in frame; as to the former, rather the reverse, I think.

Of the experiment with the staff, I shall simply state that in my case, on two occasions, the staff gyrated rapidly about its long axis, obliging me to quit my hold. This was observed by other persons present during the experiment. In the test with the hat, Miss Lulu stands before you with her hands extended horizontally, palms up, with the little fingers and sides touching each other. On the surface thus presented we place our hat, with the outer aspect of the crown resting on the two palms. The experimenter is then invited to lift the hat off. When I tried this experiment, the hat was only removed after considerable force was exerted, and then came away with a crackling noise, as if charged with electricity. That Professor Newcomb's explanation would not account for the result here, I would say that I knelt in such a position that my eyes were but a short distance away; and my line of vision was in the same plane with the opposed palmar surfaces and the crown of the hat. This latter was of very light Manila straw, with the outer periphery of the crown rounded. Now, as the form of this surface was a broad ellipse, with a major axis of perhaps seven inches, and a minor axis of six, quite smooth, it would be simply an impossible feat for Miss Lulu to seize it when the distance between the inner margins of the opposite thenar eminences in a right line is less than six inches.

Permit me now to present a test which Professor Newcomb did not witness. It consisted in standing upright, with one foot in advance of the other to act as a brace, and holding in the hands with a firm grasp an ordinary chair. This is to be done by seizing it at the rear uprights, about where the back joins the bottom; the former being towards you, and parallel with your anterior chest-wall, against which you place your elbows at a convenient distance apart. This position evidently leaves a space between your chest and the back of the chair equal in length to your fore-arms, which are extended horizontally. Miss Lulu now takes a position beside you, and, holding her body back, simply places the palmar surface of her hand on the back of the chair on the side towards your body. After a few moments she seems to make the effort to detach her hand from the chair, which latter you are privileged to push forwards. The force at work, however, is too strong for you, and both yourself and the chair are carried backwards, without her hand having changed its position. The chair being a cane-backed one, it is evident that she could in no way gain a hold upon it, and the back of her hand never could come in contact with your chest, as the spanning of such a distance would at once be detected.

Professor Newcomb's conclusions, after having witnessed the test of lifting a chair with some one sitting in it, are to me far from satisfactory. I saw the girl lean over an ordinary chair, with a man weighing over two hundred pounds sitting in it, and placing the palmar surfaces of her hands on the outer sides of the rear uprights near their middles, and *without any* contraction of the muscles of the arm or fore-arm, or increase of pulse (remained at 80) or respiratory effort, or change of countenance due to exertion, so far lift that chair and its heavy contents from the floor as to compel the latter to get out of it; and this without fracturing any of the bones of her upper extremities, or the sides of the chair. The simplest computation will prove that the *lateral pressure* required must be enormous in order to get a hold, and prevent such a weight absolutely slipping between her hands when the upward force comes to be exerted.

R. W. SHUFELDT, U.S.A.

Fort Wingate, New Mexico, Feb. 19.

THE MICROSCOPE IN GEOLOGY.

MANY persons have heard that the microscope, everywhere recognized as indispensable in the investigation of organic nature, has also recently been made use of in geology; but very few have any distinct notion of the sort of problems to which it can there be applied, or of the way in which it can contribute toward their solution. The determination of the different minerals which compose very fine grained rocks may doubtless appear, even to many geologists who have been accustomed to deal with only great areas and mountain masses, a matter of small importance; and they often fail to see that the methods which render such a determination possible, are capable, if properly employed, of throwing much light on some of the most difficult questions with which they have to deal.

The microscopic study of rock-sections is one of difficulty, and indeed quite discouraging to a beginner who attempts it without proper guidance, no matter how familiar he may be with mineralogy, or with the use of the microscope in other fields of research. This fact, coupled with the newness of the branch, sufficiently accounts for the number of workers in it still being so small in this country, which presents unrivalled opportunities for its cultivation.

Although the idea of preparing rocks in transparent sections for the microscope originated with an Englishman, the fruitful line of research to which it gave rise has since been almost exclusively cultivated in Germany. Here the seed fell into soil made already fertile by the labors of older geologists, and sprang at once into a strong and rapid growth. The keen perception and great energy of Zirkel first made known the microscopic appearance of the common rock-forming minerals, as well as discovered the wide distribution of others before considered rarities. Vogelsang, not contented merely to observe, was able to draw from his studies the most suggestive conclusions, which he substantiated by ingenious and delicate experiments. It is, however, to Rosenbusch that the development of petrography as a science is most largely due. In his work, published in 1873, he showed in a masterly manner how what had been learned of the optical properties of different crystals, especially their action on polarized light, could be applied to their identification in thin sections, thus rendering a rigid microscopic diagnosis for the first time possible. From this time on, the interest in this branch of investigation became in Germany very general, and its growth proportionately rapid. The attainment of the long-desired separation of rock constituents, even when of the smallest size, by means of solutions of high specific gravity, and the perfection of many micro-chemical reactions of great precision, followed each other in quick succession, until to-day the accuracy and beauty of petrographical methods are hardly second to those found in any other branch of natural science.

The geologists of other countries on the continent, especially in France and Scandinavia, soon perceived the value of the German work, and early availed themselves of its results to start similar investigations in their own countries. It is a surprising fact that the appreciation of it among English-speaking people has been so slow, that not one reliable text-book on the subject of petrography exists in the language of the man who gave the first impulse to its modern development. Any knowledge of the subject in America is recent, dating from the publication of Zirkel's 'Microscopical petrography' in 1876. How steadily the inter-