latter. This can again be proved by measuring the influence of the change of concentration of a salt solution on that outer surface, which is exactly the same as it was before the pressure was applied. If, however, we connect this part of the skin and an intact part of the skin with a pair of calomel electrodes filled with a KCl solution of the same concentration, we get an E.M.F. of the same order of magnitude and the same sign, as if the skin at the pressed spot had been removed. This experiment, which is very striking, indicates also that the current of injury is due to the existence of a potential difference at the inner surface of the skin of the apple which depends upon the integrity of a definite structure.

3. An attempt to account for the nature of this E.M.F. led to the discovery that salts and acid, if applied in the same concentration to the outside surface of an apple, give rise to differences of potential of the same order of magnitude as found in the current of injury. The E.M.F. of the cell

n/10 NaCl | uninjured apple | n/1,000 NaCl | n/10 NaCl (I.)

is greater than that of the following cell

n/10 NaCl | uninjured apple | n/1,000 HCl | n/10 NaCl (II.)

In (I.) the E.M.F. was .088 volt, in (II.) .038 volt.

4. Since this difference is of the order of magnitude of that found in the current of injury, it was natural to test the action of the juice pressed out of the apple. Its conductivity was found to be $K_{18}0 = .00226$. This would correspond to a concentration of $n/58$ if the electrolyte contained in the sap were KCl, or $n/170$ if it were HCl. The apple juice contains a considerable amount of malic acid. Nevertheless it does not have the negative effect characteristic of the acid. If the negative potential on the inside of the skin is due to a layer of acid it must differ in its action from the sap pressed out from the apple.

These experiments indicate that the current of injury of the apple is due to a potential difference at the inner limit of the skin or membrane; and that this potential difference depends upon the integrity of a preformed structure. This structure may give rise to the formation of a film of an acid but this is hypothetical.

Our observations prove that Hermann's alteration theory of the current of injury can not be correct. This theory assumes that the difference of potential exists at the injured surface, while the experiments mentioned here show that the seat of the potential difference is, at least for the apple, not at the seat of the lesion, but at the inner limit of the intact skin or membrane and its intact adjacent layer. DuBois's preformation theory is confirmed, although in a different form from that which this author suggested.

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SOCIETIES AND ACADEMIES

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 498th regular meeting of the society was held in the assembly hall of the Cosmos Club on April 13, 1912, with President Nelson in the chair.

Under the head of General Notes, Dr. B. W. Evermann exhibited dyed and undyed skins of fur seals from the Pribilof Islands, and made remarks on the commercial classification of skins and on the aims of the Bureau of Fisheries regarding the fur-seal industry.

The paper of the evening was by Mr. Chas. Sheldon on "Winter Animal Life about the Base of Mt. McKinley." Mr. Sheldon gave an interesting account of his experiences with the birds and mammals of the Mt. McKinley region during the winter of 1907–08, describing in detail the food and habits of the Alaska jays, the mallard ducks, which were found wintering where local conditions favored open water and sufficient food, the lynx, conies, foxes, caribou, moose and sheep. Mr. Sheldon's lecture was admirably illustrated with numerous lantern slides, showing his cabin, general and detailed views of the country and long- and short-range snap shots of all the larger animals of the region.

THE 499th regular meeting of the society was held in the assembly hall of the Cosmos Club on

April 27, 1912, with President Nelson in the chair. Three papers were presented:

Are Rabbits Rodents? J. W. Gidley. (To appear in Science shortly.)

Remarks on the Skeleton of the Dinosaur, Stegosaurus: C. W. Gilmore.

The type specimen of *Stegosaurus stenops* Marsh in the U. S. National Museum is the most complete skeleton of the genus that has yet been discovered, and the recent assembling of the large blocks of sandstone which contain this fossil enabled Mr. Gilmore to discuss several points in its anatomy. Especially attention was given to the position and arrangement of the elements which comprise the dermal armor, and since this is the only individual known which gives anything like a true idea of the manner in which the armor was attached the importance of the specimen is at once apparent.

It was pointed out that there was a great diversity of opinion among vertebrate paleontologists, especially regarding the number and arrangement of the plates and spines constituting the exoskeleton. Marsh in 1891 made the first pictorial restoration of *Stegosaurus* and placed the series of flat plates (12 in number) in a single row along the median line of the neck, back and tail, with four pairs of spike-like spines near the end of the tail. Lucas in 1901 published the next restoration, and was the first to show the plates (28 in number) arranged in pairs. Later in a statement prepared under his direction the plates of opposite rows (22 in number) were made to alternate, and the spines were reduced from four to two pairs. The latest conception, as exemplified by a recently mounted skeleton in the Peabody Museum of Yale University, shows a return to the paired arrangement of the plates (28 in number) and the retention of four pairs of spines.

It was shown that specimens in the National Museum corroborated most conclusively Lucas's second interpretation, and with the exception of one or two points is entirely in accord with the evidence.

That the plates of opposite rows did alternate is shown by the way they lay embedded in the rock, and that no two of them were precisely similar in shape or dimensions.

It was demonstrated that the usual number of spike-like spines is two pairs, as shown by seven individuals, six of which are in the National Museum.

The facts relating to the dermal armor which now appear to be established from this preliminary study are:

1. That the armor of the neck, back and tail was found by two rows of erect plates, the elements of one row alternating with those of the other.

2. That the total number of plates in the two rows was not less than 22.

3. That the position of the largest plate of the series appears to be above the base of the tail, and not over the pelvis.

4. That the usual number of dermal spines on the tail is 4, arranged in two pairs.

Early Bird Migration in a Late Spring at Washington, D. C., 1912: Wells W. Cooke.

The winter of 1911–12 was the coldest at Washington, D. C., for many years, and yet several species, notably the robin, were more common than usual, due to unusually warm weather in December.

January, February and March to the 27th were far below the normal, and yet about half of the species of birds that arrived during this period were earlier than their average date. When, however, these species were examined more carefully, it was found that those who arrived early were all species that occasionally winter as far north as Washington, and these early migrants undoubtedly represent individuals that had spent the winter in the heavily forested swamps and had been observed when they returned to open country.

The rest of the species that arrived late during this cold period were all birds that winter far to the south of Washington.

On March 28 the weather turned warm and remained above normal for a whole month. Immediately birds began to arrive from the far south that were decidedly ahead of their normal date, and in the case of some of them, earlier than the earliest previous date. This is one of the best examples of what usually happens when a cold spell begins to break. The cold had been widespread, holding the birds far south, and when the warm spell began the birds rushed north and continued their flight longer than usual until they were actually ahead of their schedule time.

Almost every species for the whole of the rest of the migratory season of 1912 at Washington, D. C., arrived earlier than their average dates.

M. W. Lyon, Jr.,
Recording Secretary, pro tem.

Washington, D. C.