cast off, are previously deprived of their connection with nutrient fluids by the development of a layer of non-tubular tissue between them and the vascular surface, with which they were originally connected and from which they derived their nutriment.

In order to facilitate description, Mr. Tomes proposes to use several terms as indicative of the arrangement and number of the component tissues of teeth, which he defines and describes at length.

A minute description of the dental tissues of upwards of fifty species of rodents forms the larger part of the paper. They are taken in the order proposed by Mr. Waterhouse in his arrangement of Rodentia published in Johnston's Physical Atlas. The author has followed this arrangement, because he finds that it accords with the modifications of the dental tissues. The incisors are described as possessing the most strongly marked and constant characters.

The anterior surface of the incisors of many rodents has a deep brown colour, which has been attributed to the presence of a layer of coloured cementum. The author states that the enamel fibres can be traced through this coloured part to the surface of the tooth, and hence regards the colour as a stain resident in the terminal ends of the fibres, and derives the presence of cementum in this part of the tooth.

The great distinguishing structural feature in this order of quadrupeds consists in a lamelliform arrangement of the fibres of the enamel in the inner division of that tissue.

The author then enters into an elaborate and detailed account of the peculiarities of this structure, as exhibited in the *Sciuridæ*, in the different members of the family *Muridæ* in the Hystricine family, the *Leporidæ*, &c., and finally considers the following conclusions as established by these details:—

"That the teeth of some species of the order have specific structural characters by which they can be distinguished from any other known teeth. That in the teeth of all the Rodentia, excepting the family Leporidæ, a portion of the enamel has a lamelliform arrangement of its fibres; that the enamel lamellæ have a different and distinctive character in each of the larger groups, and that the variety of structure is constant throughout the members of the same group;" —"and that the variety in the structure of the dental tissues, with a few isolated exceptions, justifies and accords with the arrangement of the members of the order into the several divisions proposed by Mr. Waterhouse, and deduced by him from the relations of the several parts of the skull."

It is stated at the conclusion, that the author purposes in a future communication entering into the development and the special adaptation of the peculiarities of the dental tissues which it has been the business of this paper to lay before the Society.

2. "On the Meteorology of the Lake District of Cumberland and Westmoreland, with a continuation of the results of experiments on the fall of Rain at various heights, up to 3166 feet above the Sea-Level." By J. F. Miller, Esq., F.R.A.S. Communicated by Lieut.-Col. Sabine, R.A., For. Sec. R.S.

In this communication are given the results of the observations of the quantity of rain which has fallen during the year 1849 at twenty stations in the valleys, and six mountain stations, varying in altitude above the sea from 500 feet to 3166 feet. There is also given a table of the temperature at Seathwaite in Borrowdale during the year 1849.

With reference to the mountain gauges, the author observes that, on the whole, the results are similar to those of the three preceding years, but, as might be looked for in a dry year like the past, the quantities of rain deposited at the various stations are more nearly equal than usual. With respect to the temperature, he observes that the statement he made in his last communication, that "the inhabitants of the Lake District valleys enjoyed a milder and more equable climate than the residents in the open country, and particularly in the winter months," is confirmed by the thermometrical results of the present winter (1849–50).

3. "On the relation of the Air and Evaporation Temperatures to the Temperature of the Dew-Point, as determined by Mr. Glaisher's Hygrometrical Tables founded on the factors deduced from the Six-hourly observations made at the Royal Observatory, Greenwich." By J. F. Miller, Esq., F.R.A.S. Communicated by Lieut.-Col. Sabine, R.A., For. Sec. R.S.

After pointing out the importance of the hygrometer, both in a scientific and a practical point of view, the author goes into the question of the advantages and disadvantages attending the use of Daniell's hygrometer, and the relative merits of this instrument and the dry and wet-bulb thermometers. Although satisfied of the accuracy of Mr. Glaisher's Tables (founded on the Greenwich Observations), which show at once the relation of the temperature of evaporation to that of the dew-point, he was unwilling to abandon the use of Daniell's apparatus for that of the wet and dry-bulb thermometers, slight as is the trouble of observing them, without personal experience of the correctness of the tables from which the dew-point was to be deduced. He therefore instituted a series of perfectly comparable observations by the two methods, and in this communication gives the results obtained from them during a period of twenty months. From a comparison of the dew-points determined by the two methods, he concludes that the results show in a striking manner the extreme accuracy of Mr. Glaisher's Tables, and afford additional testimony to the value of the Greenwich Hygrometrical Observations, and the resulting formula on which those tables are founded.

The author then refers to the subject of evaporation, and gives the results of his own observations at Whitehaven during six years, viz. from 1843 to 1848 inclusive. From these he states that the mean annual amount of evaporation is 30·011 inches; and the mean quantity of rain for the same period being 45·255 inches, the depth of the water precipitated exceeds that taken up by evaporation, on the coast in latitude $54\frac{1}{2}^{\circ}$, by 15·244 inches.