

veloped should have been maintained.* † In the second place accuracy of skin localization is always a function of the mobility of the part. Where anatomical structure varies within narrow limits the sensation areas are small. As the tongue is far more mobile (the mobility is highly useful) than the finger tips, it could more readily develop and retain tactual sensitiveness.

In all cases where the structure or function of an organ is useful to the individual it may be attributed to the survival of variations or the inherited effects of use, and it does not seem that tactual discrimination helps to decide the all-sufficiency or relative importance of one of these factors.

When Mr. Spencer says that the sensitiveness of the tongue has been developed by involuntary and useless rubbing over the teeth, he seems to betray a complete misapprehension of the facts of psychology. The skin becomes less, not more sensitive by continual rubbing of the clothes, the contact of air, blood and food does not develop the accuracy of local discrimination in the inner organs of the body, etc.

I scarcely know a worse argument than this of Mr. Spencer's: (1.) That the blind are shown to have greater tactual sensitiveness than the seeing. [This would not be proved by Mr. Spencer's experiment but was well known.] (2.) That in these cases the practice of the blind has developed new anatomical structures of the peripheral and central nervous system. [A greater increase in accuracy of local discrimination can be developed with five minutes' practice.] (3.) That the anatomical structure acquired by use is hereditary. [This begs the question at issue.] (4.) That the relative sensitiveness of the skin cannot be accounted for by the survival of useful variations. [It is amply accounted for.] (5.) That useless sensitiveness has been developed by continual stimulation. [This is nonsense.] J. MCKEEN CATTELL.

BIBLIOGRAPHY OF NORTH AMERICAN PALEONTOLOGY.

ONE of Mr. Van Ingen's criticisms in a late

* It may be remembered that Mr. Spencer thinks that organs will not disappear through 'natural selection' when they become useless.

† The nose is also used as an organ of touch by the lower mammals, and naturally remains more sensitive than the top of the head.

number of SCIENCE, on the recently issued Bibliography of North American Paleontology, 1888-1892, suggest that one of the errors into which he has fallen might also apply to others, particularly authors in paleobotany whose names have been omitted and of which a number are given as not being listed. The paleobotanical papers were omitted intentionally for the reason that they were already receiving attention for publication in the U. S. National Museum when the work on the Bibliography was commenced. This fact should have been perhaps emphasized in the preface. But that there is so large a number of omissions as is claimed cannot be for a moment believed until substantiated by facts. In case the latter are forthcoming it would save much trouble in looking them up. Several, at least, of the 'valuable' additions made by Mr. Van Ingen as appearing during the period, while they do bear an included date on the title pages, were not received until sometime afterward, as library records clearly show.

As to many of the titles not being given in 'full,' as it is claimed by Mr. Van Ingen to be promised in the preface, it need only be stated that if he had turned his naked eye to the Bibliography instead of his microscope, he would have found some 800 other titles not given 'in full,' in place of the half dozen cited as examples of 'wrong copying.' In a listing of the papers all articles and often unimportant adjectives were purposely omitted, for reasons obvious to everyone familiar with bibliographic matter. 'Full' is clearly used in contradistinction to the usage in the secondary references where abbreviation as great as possible is necessary.

The regret expressed by Mr. Van Ingen that the Bibliography was not printed on one side only is no doubt shared by many 'working paleontologists,' even though Uncle Sam could not anticipate the utility of printing so valuable a work in colors to suit each prospective peruser. The special defect mentioned is, however, readily overcome by transmitting 20 cents to the director of the U. S. Geological Survey for a second copy of the work, that the 'pasting on cards' may go on uninterruptedly.

CHARLES R. KEYES.