

SCIENCE.

FRIDAY, AUGUST 22, 1884.

COMMENT AND CRITICISM.

MEMBERSHIP in the American association for the advancement of science is readily attainable by any one willing to pay a small annual fee, and it is largely affected by the localities which it visits in its annual peregrination. So many sections of the northern half of the United States have already been visited, that one would suppose the membership would now fairly represent the distribution of interest in science throughout the country; though for various reasons, and particularly because the association has never, at least in recent years, met there, one would expect a feeble showing from the southern and Pacific states.

An inspection of the list of present members shows, however, some curious anomalies. The total number of members is 2,011. The cities having the largest number of members are New York (153), Boston (142), Cincinnati and Washington (127 each). The next highest is Montreal (71), where the meeting was held two years ago, which distances Philadelphia (51), which, in its turn, is scarcely ahead of St. Louis (49) and Cambridge (47). New Haven (30), with all its scientific activities, is not so far beyond Hartford (19) as we should expect. Chicago shows a meagre number (26), and is surpassed by Baltimore (28). Salem, as the nominal headquarters of the association, hardly responds with credit (20), while Minneapolis (31) surpasses Chicago and Baltimore. Providence (15), where the association has not met since 1855, makes a better showing than Indianapolis (7), where it met in 1871; or Dubuque (1), 1872; or Detroit (6), 1875; or Buffalo (12), 1876. Several of these are surpassed by New Orleans (10), near which the association never ventured, and by San Francisco (6), still farther removed from its activities; while Charleston, where

the association met in 1850, finds no representation whatsoever.

More than one-third of the association come from New York (349) and Massachusetts (341). Ohio (208) comes next, followed by the District of Columbia (129), Canada (120), and Pennsylvania (111). No other states furnish more than 100 members; but it is unexpected to see Connecticut (73) neck and neck with Missouri (72); Rhode Island (29) far in advance of Vermont (18) and Maine (14); Michigan (25) below Minnesota (54); Kansas and Nebraska (5 each) following Colorado (9), and even New Brunswick, Alabama, Florida, Texas, and West Virginia (7 each). Kentucky (31) surpasses Iowa (25), and Indiana (39) lags far behind Illinois (69). An examination of the list on the basis of population would, no doubt, prove interesting.

How old may a newspaper be and still be a newspaper? This question has been up for decision before the secretary of the treasury, and it has been decided that a newspaper ceases to be a newspaper when it has another beside it. One newspaper is a newspaper: two or more newspapers sewed together are not newspapers, but form a book, 'at least printed matter.' All this means that a New-York importer desired, as his customers most certainly desire, that some bound volumes of periodicals should be admitted free of duty as periodicals, as, according to the last laws, the importer thought they should be. But no: the decision has come down, that "it is fair to hold it was this fresh and concurrent statement [which character it loses 'when kept for a year, and then fastened up with its fellows'] that congress meant should go free, and not (so far as news is concerned) the stale sheets, the accumulation of the year." Cannot all who may be affected, as are all readers of foreign journals, bestir themselves to prevent such needless restrictions of their rights!

The particular volumes upon which duties were called for in this case, were bound volumes of the *Annales de dermatologie* and *Annales des maladies de l'oreille*, — books which do not enter into competition with any produced in America, and which never can. If one wants a number or volume of either of these *Annales*, he must have it, and nothing else will do; and no reproduction is possible, on account of the limited demand. We have, then, one more decision which interferes with American students, makes their work the more expensive, and in no possible way can benefit the American book-maker. Congress had granted a little relief, but that little has been made less by a thoughtless decision of the treasury. We say 'thoughtless;' because it is known to but few, outside those immediately interested, that the apparatus and books used by the scientific men of America *must* to a large extent be bought where they are principally produced, in Europe; reproduction being out of the question, both on account of the limited demand, and, in case of apparatus, on account of an instrument being to some extent a work of art which only one man may be capable of bringing forth.

THE great question of our time is, How shall we better our methods of education? The main efforts to this end seem to be to better the system. The real need is of better teachers, not more painstaking or devoted teachers, for in these regards there is little to be desired; but, as a class, our teachers are men and women whose opportunities of culture, whose means of obtaining a broad view of the subjects they teach, are deplorably small. Year by year the number of those who go to the teacher's work from any thing like a university training become relatively fewer. The normal school is, unfortunately, taking the place of the university as the place of training for instructors in the primary and secondary schools. These institutions are admirably contrived to serve the immediate ends they seek to attain: they make business-like but slenderly provided instructors, who do their

routine work better than those bred in schools of broad learning, but who miss the best that a liberal training has to give. The normal school is fixed in our American system certainly for fifty years to come. The practical question is, What can be done to lift their work to a higher level?

There are two ways of doing this, each of which seems worthy of debate. One is to move the normal schools to the seats of good universities, and mingle the university teaching with the strictly technical instruction in pedagogics. The very presence at a university will give a lift to the ideals of the pupils in the normal school. It will cost a penny more to train the youth than it does at present, but this is not a question of pennies. Nobody reckons pennies in war; and this work of education is the eternal war of mankind. Another, cheaper, less effective, but still possibly useful plan is to give the normal-school teachers an occasional year of residence at a university, where they may for a time pursue knowledge for its own sake, and widen their views of their great work. Harvard university now allows its teachers one year in seven for private study. The state could afford to do as well by its normal-school teachers. If we lift the grade of our teachers, the 'system' will take care of itself.

THE government printing-office has recently issued a catalogue of the aquatic mammals exhibited by the national museum at the great international fisheries exhibition in London last year. It consists of a general account of the more interesting seals and whales of our coast, with a briefly annotated list of all the species exhibited, and is prepared by Mr. F. W. True. It detracts very much from its value that it was not printed, and ready for sale or distribution, at the time of the exhibition. To appear now, when the collection is shipped to another continent, seems somewhat of a farce, as its whole value now lies in what it contains *apart* from the collection. Either we should revise our dilatory, and at the end hasty, legislation in

such matters, or the exhibiting departments of the government will be forced to the necessity (to do proper credit to themselves) of maintaining exhibition series, which, with slight modifications for special occasions, may be kept at hand, to send wherever and whenever required. If we are rightly informed, the national museum has already decided on some such step; and, if international exhibitions are to be a yearly occurrence, the museum should add to its staff a special exhibitionary force, and not weaken its efficiency for its proper work by these constant extra draughts upon its energy.

LETTERS TO THE EDITOR.

Classification of the Mollusca.

IN Mr. Dall's kindly notice of the article 'Mollusca' in the 'Encyclopaedia Britannica,' published in your journal of June 13, he attributes to me "the erroneous statement that the radula of *Glossophora* is horny," and adds that 'it is really chitinous.' In the ordinary sense of the word 'horny,' chitin is (I venture to think) correctly described as horny. That the radula is generally considered to consist of the chemical body known as chitin is distinctly stated in the article criticised by Mr. Dall. At the bottom of p. 460 occur the words, 'a chitinous band (the radula).' I should be glad to know if Mr. Dall has undertaken any special chemical analysis of the substance of the radula (1).

With regard to the very general presence of jaws in glossophorous Mollusca, I must maintain my statement. The presence of a calcareous impregnation, it is true, not usual, but exceptional (2).

Mr. Dall is mistaken in supposing that I have followed Macdonald in regard to formulae for the teeth of the radula. The other writers whom he cites as not followed are precisely those from whom my statements on the details of this subject were drawn (3).

I have no fault to find with Mr. Dall for differing from me as to certain points of classification, but I should be glad to know his grounds for regarding the *Zygobranchia* as an artificial group. He merely reasserts the old view, which I think I have sufficiently shown to be untenable (4). Mr. Dall also asserts that the orders of *Lipocephala*, based on the characters of the adductor muscles, are defunct. In spite of this opinion, the muscles themselves still exist, and, in my opinion, furnish indications of natural and important divergent groups among the bivalves (5).

I should be glad to know on what grounds Mr. Dall considers the three divisions of *Lipocephala* adopted by me to be unnatural.

Lastly, let me say that I do not know on what authority Mr. Dall asserts that the calcareous developments of the integument in *Chaetoderma* and *Neomenia* have no relation to the shells of Chiton. That they also represent or replace the spines of Chitons is sufficiently obvious. But what is to prevent our conceiving of the epidermic shelly plate of a Chiton as originally developed by the gradual coalescence of a number of small calcareous denticles, in the same

way as the mesodermic dermal bones of bony fishes have developed from the shagreen denticles of the sharks (6)?

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University college, London,
July 23.

(1) Not being an organic chemist, I have not attempted analyses, but have tested many radulae with one result, — the cutting points of the teeth are always, and the whole radula generally, of a substance allied to chitin. The very generally erroneous statements in the text-books led to the criticism of the language of Professor Lankester as tending to continue the confusion. Chitin is surely as different chemically from horn as bone is, and it cannot be desirable to continue to treat the two substances in a way to perpetuate an error. Further data on this topic may be found in the August *Naturalist*, pp. 776-778.

(2) I should be grateful to Professor Lankester for the name of any recent mollusk having a 'shelly' or even a partially 'calcified' jaw.

(3) The formulae given for the teeth, and the method used in making a formula, as inferred from the text, which were the particular details criticised, are partly incorrect. I was wrong, however, in assigning a source to them. One (for instance, *Patella vulgata*) has the formula 3+3+1+3+3, instead of 3.1.4.1.3. No mollusk has more than one median tooth; and the central figure of the formula must in all cases be 1 or 0. I find the erroneous formula in Sars's text, though he figures the teeth correctly. Again: *Chiton stelleri* has, like all Chitons hitherto examined, the formula 6+2+1+2+6, instead of 0000.1.1.1.0000, which is given; but this is doubtless copied from some other authority. However, accurate formulae for the Chitons and Limpets have been accessible for some years. Again: the teeth of the radula are divided by nearly all modern students of that organ into rhachidian or median, lateral, and uncinial teeth, — three series which have anatomical relations to the radula, which are usually pretty clear. For 'lateral' Professor Lankester substitutes the term 'admedian,' which is not, as far as I know, in use; and for the 'uncini' he adopts the term 'laterals,' which I venture to think is undesirable as leading to confusion, and not in accord with general usage.

(4) The grounds on which I sustain the generally accepted views of malacologists, as to the relations of the groups Professor Lankester has compounded into the order *Zygobranchia*, are, that the mere abortion of one of a pair of organs is not a character of ordinal value; nor are the characters assigned to *Zygobranchia* applicable to all its members. Moreover, I am of the opinion that the characters which unite the *Rhipidoglossa* among themselves and the *Docoglossa* among themselves are of higher systematic value than the characters here relied upon for dismembering them. I believe, that, had the learned professor made researches among a large number of these forms, he would probably be of this opinion also.

(5) The characters of the adductor muscles, as long as we were ignorant of intermediate forms, seemed to afford a good basis for orders in the *Lipocephala*. Now that we know of forms which are more or less intermediate, in the *Pectinidae*, *Ostracidae*, *Mytilidae*, and other families, and that in the young (not embryonic) there are frequently two adductors discernible in supposed monomyarians, with such forms turning up as *Dinysa*, and, more recently, *Chlamydoconcha*, all tending to efface the supposed definite limits between the alleged orders, it seems impos-