rangement as will facilitate as far as possible the ready finding of the data relating to any given substance ; 4. To give the authority and reference to the original memoir in each case (the tables thus form a catalogue of the literature referring to most chemical substances) ; 5. To give, in addition, the reference, if any, to either 'Watt's dictionary of chemistry,' or to the journal of the Chemical society, for the convenience of those who are unable to refer to the original papers (this is a feature of the work which will doubtless be found particularly useful, more especially to British and American investigators). The tables will be issued in two volumes, of which the first is now ready.

— Prof. Mansfield Merriman of Lehigh university, Pennsylvania, has published a "Key to his text-book on the mechanics of materials." This key contains the answers to the problems in the text-book, and is published in response to inquiries from those who have used the book. The opportunity has also been taken to give the method of solution of a few of the difficult problems.

— The first part of the new zoölogical journal announced by us some time since, to be edited by Dr. J. W. Spengel of Bremen under the title of *Zoologische jahrbücher*, will be soon published, and will contain the following papers, besides shorter notices: Hartlaub, 'Contributions to the knowledge of the species of Manatus ;' Reichenow, 'Monograph of the genus Ploceus, Cuv.;' Bergh, 'The Marseniadae ;' Nehring, 'Contributions to the knowledge of the species of Galictis ;' Frenzel, 'On glycerine preparations.' The price of the part is nine marks. Four parts make a volume. Beside the regular parts, supplementary ones will be issued from time to time for the publication of separate papers too long to appear in the journal itself. The regular subscribers may or may not take the supplements also, as they prefer. The first of the supplements is to appear shortly, and will contain Dr. K. Jordan's memoir on the butterfly fauna of north-west Germany.

— Dr. Patrick of St. Louis has in preparation a work on the mounds of southern Illinois, based upon a large collection of crania and other objects from that region. His report will be issued by the U.S. bureau of ethnology.

— Prof. E. D. Cope of Philadelphia is about to publish a monograph on the recent batrachians and reptiles of North America, as a bulletin of the national museum. It will contain descriptions of all the species so far known, many of which will be figured, together with an extensive discussion of the osteology of the several groups, and a sketch of the soft anatomy of the leading types.

LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

International copyright.

MR. APPLETON MORGAN, in his letter upon international copyright in *Science* for March 5, says, "While always an enthusiastic advocate of an international copyright as a matter of abstract justice to British authors, I have never been able to satisfy myself of the constitutional right of congress to enact a separate bill for the purpose of effecting one." I do not intend to attempt, in this letter, to convince Mr. Morgan that the enactment of such a bill would be constitutional, but I think it may not be without interest to the readers of *Science* to point out that the passage in the constitution which grants congress the power to "secure to authors and inventors the exclusive right to their respective writings and discoveries" has been expounded to mean, of necessity, *all* authors and inventors, without regard to nationality.

Edward L. Andrews, E-q., as the representative of the Copyright association, argued before the senate committee on the library, in 1872, that, as American authors were not specified in this clause, the word 'authors' must be taken to mean all authors, wherever resident, and therefore the constitution "in this respect is mandatory in its character." But Mr. Andrews was not the first person to argue this construction of the constitution. Thirty-five years earlier this construction had so distinguished an advocate as Mr. Henry Clay. During the copyright agitation of 1836–37 in England, certain British authors sent to the United States an 'address' containing a petition to congress to grant to them "the exclusive benefit of their writings within the United States." This petition, which bears the signatures of fifty-six authors of England and Ireland, — a remarkable list of names, including Carlyle, Disraeli (father and son), Bulwer, the poets Southey, Thomas Moore, Rogers, Campbell, Chalmers and Cunningham, Harriet Martineau and Mary Somerville, besides others equally famous, — was presented to the senate by Mr. Clay on Thursday, Feb. 2, 1837. After calling attention to the distinguished names appended to the document, and explaining that it represented that the works of British authors were published in the United States without any compensation being made to them for their copyrights, and that they were frequently altered and mutilated so as to affect injuriously their reputations, because of which grievances they petitioned the passage of a protective law, he commended the address to the attentive and friendly consideration of the senate, and closed with these words: "Indeed, I do not see any ground of just objection, either in the constitution or in sound policy, to the passage of a law tendering to all foreign nations reciprocal security for literary property." This petition was referred to a select committee, which reported Feb. 16, through Mr. Clay, and asked leave to introduce a bill granting copyright to the authors of Great Britain and France, which was the first international-copyright bill presented to congress. The last paragraph of this report contains Mr. Clay's argument, referred to above, and reads as follows: "With respect to the constitutional power to pass the proposed bill, the committee entertain no doubt, and congress, as be-

fore stated, has acted on it. The constitution authorizes congress 'to promote the progress of science and useful arts by securing, for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries.' There is no limitation of the power to natives or residents of this country. Such a limitation would have been hostile to the object of the power granted. That object was to *promote* the progress of science and useful arts. They belong to no particular country, but to mankind generally. And it cannot be doubted that the stimulus which it was intended to give to mind and genius — in other words, the promotion of the progress of science and the arts — will be increased by the motives which the bill offers to the inhabitants of Great Britain and France."

I believe that the view expressed by Mr. Morgan in the last paragraph of his communication is correct, and that a "Bill to amend the Revised statutes relating to copyrights" — amending section forty-nine hundred and fifty-two by striking out the words 'citizen of the United States, or resident therein,' and substituting the word 'person;' amending section forty-nine hundred and fifty four by striking out the words 'and a citizen of the United States, or resident therein;' amending section forty-nine hundred and sixty-seven by striking out the parenthetical clause '(if such author or proprietor is a citizen of the United States, or resident therein);' and repealing section forty-nine hundred and seventy-one — would secure to foreign authors protection over their works equal to that now granted to citizens or residents. It is really in this way that the bill introduced into the senate by Mr. Hawley grants protection to the works of foreign authors; the first section being in reality a limiting provision, stipulating that the protection is only granted to authors of such countries as confer equal rights of protection to citizens of the United States, in other words a reciprocity clause. By mistake, the Hawley bill neglects to provide for the amendment of section forty-nine hundred and fifty-two, though careful provision is made for the amendments necessary in the other sections.

Thorvald Solberg.

Washington, D.C., March 30.

The distinction between anatomy and comparative anatomy.

It was not so many years ago that even those holding the highest positions in the profession of medicine regarded human anatomy as the only anatomy entitled to the name, and that comparative anatomy meant something else altogether. Its teachings were not appreciated by the vast majority of those who studied the anatomy of man, and the great surgeons of those days were rather inclined to look askant at one who indulged in researches into the structure of the 'lower animals.' But in these days such matters wear a very different aspect, for anatomy means morphology, — the knowledge of the structure of organic forms, — both living and extinct, and it is rarely indeed that we hear of any one attempting to draw hard and fast lines between the anatomy of man, and either any of his own class or other representatives of the Vertebrata.

Thanks to the progress biology has made during the last quarter of a century, all literature that has any thing to do with such subjects, actually teems with the teachings of morphology. Such being the case, one is rather disposed to regard with some measure of surprise the classification that so excellent a work as the *Index medicus* adopts for its record of such subjects. In its last issue, for instance (February, 1886, p. 54), and I believe it has always adhered to the same plan, it makes one section for anatomy, histology, and embryology, and a subsection for comparative anatomy and embryology. Now, in the section-in-chief, we find entered the recent admirable paper by Dr. E. C. Spitzka, on 'The comparative anatomy of the pyramid tract,' the contribution evidently being considered as an 'anatomical one;' while we find awarded to the subsection Retterer's article entitled "Sur le développement des tonsilles chez les mammifères," to say nothing of all the anatomical articles from the last number of the *Journal of anatomy*, of London.

Now, as fully the larger share of Spitzka's memoir is devoted to the study of the pyramid tract in other animals than man, it would seem, even according to the plan adopted by the *Index medicus*, that that essay has not fallen into its proper section. The same stricture applies, for a similar reason, to Retterer's paper. Surely it would seem better to have one section devoted to morphology, to include all contributions that refer to the structure of organic forms, and, if necessary, two subsections, — one devoted to histology, and the other to embryology.

R. W. Shufeldt.

Fort Wingate, N. Mex., March 30.

Penetrating-power of arrows.

You doubtless have read of the wonderful feats of archery said to have been performed by savage archers. Cabeça de Vaca, for instance, tells us that the good armor of the Spaniards was no protection against these missiles. Some of the men swore that they had seen two red oaks, each the thickness of the lower part of the leg, pierced through from side to side by arrows. I myself saw an arrow that had entered the butt of an elm to the depth of a span. The same author states that the corpses of the Spaniards were found to have been traversed from side to side by arrows. An instance is given, where an arrow shot by an Indian pierced through the saddle and housings, and penetrated one-third its length into the body of a Spaniard's horse. These quotations from Jones's 'Southern Indians' might be increased to any number, covering a period from the Homeric age to our day, all showing the popular belief concerning the power of the arrow.

I desire very much to induce our archery clubs to institute a series of careful experiments upon the following points: —

1. How far can an arrow be shot in a calm? How far with or against a moderate calm?

2. What is the greatest distance at which an arrow can be shot with any degree of accuracy? Experiments should be made both as to the vertical and horizontal.

3. What is the momentum of an arrow leaving a bow? (Tested by shooting against a disk attached to a graduated scale.)

4. What is the penetrating power of an arrow into animals? This may be tried with horses, cattle, or dogs, which have just died, or with those in an *abattoir* just about to be slaughtered.

5. The register of the bow as to length, etc., and