

— Much progress is being made in Scotland toward the development of a university extension scheme similar to that described in a recent number of *Science* by Mr. Oscar Browning.

— On account of failing health, Professor Tyndall has resigned his position at the Royal institution.

— The article on the French lycée, which appeared in this journal for Feb. 18, was, by an oversight, not credited to the *Canada educational monthly*, as it should have been.

LETTERS TO THE EDITOR.

*.*The attention of scientific men is called to the advantages of the correspondence columns of SCIENCE for placing promptly on record brief preliminary notices of their investigations. Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

The editor will be glad to publish any queries consonant with the character of the journal.

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

The rudimentary metacarpals of bison.

IN *Science* for Feb. 18 Dr. D. D. Slade notes the fact that the skeleton of aurochs in the Museum of comparative zoölogy has rudiments of the second metacarpals, while the rudimentary fifth metacarpals are wanting. Dr. Slade will, I trust, pardon me for saying that the deduction he would make from this fact is not quite clear to me. If he considers it an individual peculiarity, I heartily agree with him; but, if he concludes from the evidence presented by this one skeleton that the arrangement of the rudimentary metacarpals in *Bison bonasus* differs from that of *Bison americanus*, I desire to protest most emphatically against any such inference.

Just now, by the efforts of Mr. Hornaday, the U. S. national museum has provided itself with a goodly number of skeletons of *Bison americanus*. Examination of four or five of these shows that in every case rudiments of the second and fifth metacarpals are present, the second being always the smaller of the two pairs. As these are all *in situ*, there can be no mistake in the matter. Our mounted skeleton of *Bison americanus* has only the fifth metacarpal present, but this is because the others have (or at least one of them has) been lost. There is a well-defined articular facet present for the second right metacarpal, but none for the left, although this may none the less once have been present.

The skeleton of aurochs in the national museum has, as Dr. Slade notices, the second and fifth metacarpals present. That, as now mounted, the inner metacarpal on one leg is larger than the outer, proves nothing, as a transposition may readily have been made by the preparator; and no one knows better than the writer how easily such a mistake may be made.

Until a far greater number of skeletons of aurochs have been examined, it would seem the safer course to assume that *Bison bonasus*, in the matter of its metacarpals, makes no departure from the usual order of things found in the Bovinae, and that the Cambridge specimen is merely a case of individual variation.

FREDERIC A. LUCAS.

Washington, D.C., April 10.

The Bellville meteor.

Messrs. A. S. Barnes & Co., publishers of school text-books, have just received the following letter, which is copied *verbatim et literatim*, and published for the public good:—

"April 1 1887

"Bellville ohio

"Gents sir to you

We read & hear a great deal of Meteors what thay are i went To see one that fell last fall In november i saw it the papers That it is found hundreds of People went to see it is a curiosly Thair is no print yet discribed Its facts yet as when you see it With the naket eye that some Astronomy aught to have it For the benift for his books It is a curious stone it is the oddes Shaped stone that ever was by man Or all that i talked with that seen it i asked Mr Phiel how Far him & his son was from it When it fell he told me about 4 rods he says it made The earth shake and a Trementous smel of sulpher It shocked him he went to Worke and dug it out and Took it town it raised the Accitement a greate many people Told me that thay would paid him 50 cts for to see but he left it Public for all to see it some said he aught to travil with It and put on exbition but He says that dont suit for he haint got gab enough for That business that will do some One ells he says if he can find out .P. T. Barnums address he Is going to rite to him and Try to sell it to him and Take it with his show for he can make money with it i asked him what he would Take for it he said he might take between 2 or 3 hundred dollars Mr Barns That would suit you in your Great store if you Gents would Have that meteors in your store Thair would thousands of people Would stop and see it and Pay 25 or 50 cts to se it i Must clos for it is almost Train time for i going to Kanes if you want to rite about the meteor or get some one ells Address

A. B. Phiel,

Bellville Richland
County ohio

"For he will give the full Particulars of it

"Yours Truly from
WM. H. BEAM."

A sensitive wind-vane.

The importance of the sensitive wind-vane question may justify still further trespass upon the space which you allot to correspondence. I am obliged to Mr. Curtis for calling my attention to Mr. Osborne's sensitive vane, as I did not know of it before.

On reading Mr. Osborne's paper, however, I find that his plan was essentially different from mine, in that he applied a liquid damper to the registering-apparatus, and not to the vane itself. In my opinion, there is a decided advantage in controlling the motion of the vane. If it be allowed an unrestricted motion, as is generally the case at present, the influence of its false movements and positions must be felt in some degree by the registering-apparatus, even when that is damped as suggested by Mr. Osborne. The direct damping of the vane will be cheaper and less complicated. As to the length of the vane, I believe that a vane controlled in this way need not be over five feet in length. A vane is often subjected to severe vertical strains, and it should be proportioned so as to endure these without danger. Mr. H. Helm Clayton seems to have entirely misunderstood the question under considera-

tion, which concerns the vane itself, and not the registration of its movements; and in justice to the signal office it ought to be said that a method of registration precisely similar to Dr. Draper's has been in use for many years. Indeed, it is through the study of the records made by this method that the imperfections of the vane are made to appear.

T. C. M.

Terre Haute, April 11.

The power of a voter.

In the general election of 1884 the total number of votes cast in the country was 10,048,061. The number of senators is 76, and the number of representatives is 325. With these numbers, and the total vote of each state in this election, the following table has been computed, in which the figures of the columns give the relative power of votes in the different states:—

	Senatorial power.	Representa- tive power.	Presidential power.
Alabama.....	86	52	65
Arkansas.....	105	40	56
California.....	68	31	41
Colorado.....	199	15	45
Connecticut.....	96	29	44
Delaware.....	439	33	100
Florida.....	221	33	67
Georgia.....	92	70	84
Illinois.....	20	30	33
Indiana.....	27	26	30
Iowa.....	35	29	35
Kansas.....	50	26	34
Kentucky.....	48	40	47
Louisiana.....	121	55	73
Maine.....	102	31	46
Maryland.....	71	32	43
Massachusetts.....	44	40	46
Michigan.....	33	27	32
Minnesota.....	70	26	37
Mississippi.....	110	58	75
Missouri.....	30	32	36
Nebraska.....	98	22	37
Nevada.....	1,033	78	234
New Hampshire.....	156	24	47
New Jersey.....	51	27	34
New York.....	11	29	31
North Carolina.....	49	34	41
Ohio.....	17	27	29
Oregon.....	251	19	57
Pennsylvania.....	15	30	32
Rhode Island.....	403	61	122
South Carolina.....	144	76	98
Tennessee.....	51	38	46
Texas.....	41	34	40
Vermont.....	223	34	67
Virginia.....	46	35	42
West Virginia.....	100	30	45
Wisconsin.....	41	28	34

In many of the states the conditions are such that a full vote is rarely polled. The smallest percentage of voters to males over twenty-one years was in Rhode Island, where it was less than 43 per cent. In Massachusetts and Mississippi the percentage was about 60. In Florida it was more than 90 per cent. Notwithstanding this defect, the table shows very well how political power is distributed among the voters with respect to the legislative and executive branches of the general government. It will be seen that the distribution of this power is much more uniform in the house of representatives, as was intended; and this fact will evidently be a source of power to this house in its conflicts with the other branch of

the legislature. On the other hand, the difference of the senatorial power of voters in the states has become very marked. Thus a single voter in the state of Nevada has as much senatorial power as 91 voters in New York; and a voter in Delaware, 39 times as much as one in New York, and 9 times as much as one in Kentucky. The New England states have more than 9 times the power of New York. In addition to this, in some of the states the senators are elected by a minority of the voters. Where political power is so unequally divided, the respect for the legislative body will depend largely on its wisdom, and the fairness of its conduct towards the whole country. But it is doubtful whether such a condition is permanent.

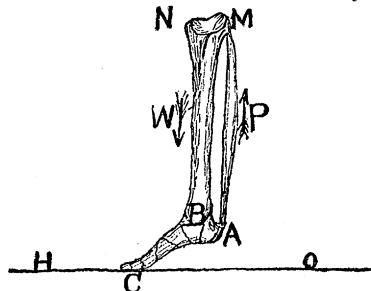
ASAPH HALL.

Washington, April 4.

On tiptoe.

Allow me to say a few final words. The *fulcrum* of a lever is that axis of rotation with reference to which an equation of moments, *consistent with the principle of work*, can be stated. It is my belief that the ankle is the fulcrum of the foot under the circumstances of the problem before us.

How can Professor LeConte's equation be correct as it stands, $P \times CA = W \times CB + P \times CB$, unless the traverse of P be the distance 'virtually' moved



over by the point A of his figure? I claim to have proved that the traverse of P is *not* that distance, but that the arm of P is BA , if the arm of W be CB . If the toe *must* be the fulcrum, a proper equation of moments may be stated by regarding the case as of the third order, with power 'virtually' applied at a distance from toe equal to the distance between heel and ankle. On this view, a foot might be constructed which could be regarded as of the second order, by putting ankle nearer to toe than to heel, or an indeterminate case could occur if ankle were midway between toe and heel. Why not proceed as in the case of the Roberval balance, for instance, by tracing the pressures, produced by bodies applied to the system, to the axes of rotation where such pressures become effective as 'power' and 'resistance'?

Finally, I regard the case under discussion as of the first order, because, first, no proper equation of moments seems possible with power at heel and fulcrum at toe; secondly, a 'virtual' axis must be assumed with power at ankle and fulcrum at toe; thirdly, with power at heel and fulcrum at ankle, the conditions are as usual, except that the mutual tendency of the earth and the 'weight' to approach each other—which tendency produces the 'resistance'—is exerted by the earth at the end of the lever and by the weight at the fulcrum, instead of *vice versa*.

F. C. VAN DYCK.

New Brunswick, N.J., April 9.