

a 'handle to facts,' or as names of objects of which we have to speak, it seems desirable to have them so typographically distinguished that their presence on a printed page will quickly catch the eye as guide-posts to the subject of the immediate context.

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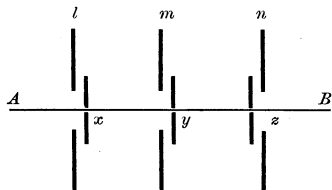
[The editor has yet to be convinced that typography should be moulded to suit the purposes of an indexer.]

Eating horns.

Indians eat the horns of the deer when in the velvet. One day on the Sioux Reservation, in Dakota, a deer was killed near camp, and brought in entire. At sight of it, Pahlani-ote, a Minneconjon of some fifty years, dropped his usual statuesque attitude, knocked off the horns, and, seating himself by the fire, began at the points to eat them, velvet and all, without cooking, as if they were most delicious morsels. The others of the party looked on as if they envied him. They said they always ate them so. S. GARMAN.

Radiant heat.

In a letter to *Science* of Dec. 21, 1883, Dr. Eddy has endeavored to show that I was mistaken in thinking that his proposed arrangement for proving that radiant heat is not subject to the second law of thermodynamics would not work.



I can most easily explain how Dr. Eddy is again mistaken by referring to my diagram which he reproduces in his letter. Dr. Eddy says that *every time* the door *z* is opened two quantities of heat pass into the region *B*, one of which had originally come from *A*, and the other from *B*. I had assumed that the occasions when it opened to let heat that had come from *A* pass were different occasions from those when it opened to let that from *B* pass. I assumed this, because I could see no way of getting the heat that had come from *B* back again through *z* in the same direction as it had come out, except by a reflection from the back of *y*; and of course that required *y* to be shut at the time of reflection, so that this heat could not reach *z* at the same time as any heat that had originally come from *A*. I have been unable to think of any method of getting the heat from *A* and what had come from *B* to travel *simultaneously* in the same direction; and I am inclined to think, that, if this were possible, Dr. Eddy's doors, etc., would not be required to enable *A* to radiate more heat to *B* than *B* does to *A*. This supposed arrangement might, as far as I can see, go on working continuously, returning the heat to *B*, and simultaneously transmitting that from *A*; for this seems to me to be what Dr. Eddy postulates as possible.

If the two quantities pass into *B* through *z* in two different directions, then two other quantities will escape from *B* in these two directions, and *B* will be in exactly the same condition as it would be accord-

ing to my hypothesis that they passed into *B* at different times.

Dr. Eddy confesses to being unable to see how to accomplish what he postulates with my arrangement of screens and apertures; and I believe that the only reason he is unable to do so, and imagines that his own proposed whirling tables would do so, is because my arrangement is so much simpler than his, that it is almost impossible to be misled as to where and when the heat comes in and goes out; while, with his arrangement, he has so many holes that it is almost impossible to keep before one's mind all that is supposed to be going on. I cannot see how my simple arrangement is less general than Dr. Eddy's complicated one, as it seems to me that a multiplicity of holes cannot be of any real use, while they produce very serious complication; and, except in the number of holes, I think Dr. Eddy's arrangement only differs from mine in that his supplies a mechanism for opening the apertures, which, of course, has nothing to do with the question. If Dr. Eddy will explain how he manipulates so as "to bring the heat coming from *A* into a position such that it would be in readiness to pass into *B* at the same time," and in the same direction, "as the heat which originally came from *B* is returned to *B*," and does not rest upon the authority of Professor Gibbs that his arrangement does so, then I will agree that he has invented an arrangement by which the second law of thermodynamics may be cheated.

GEO. FRAS. FITZGERALD.

40 Trinity college, Dublin,
Jan. 7, 1884.

Professor De Volson Wood makes statements in his letter published in your issue of Jan. 11 which appear to me unsupported by facts. Were your columns open to a lengthy discussion, I should like to show this in detail. Suffice it to say, that in his reference to Mr. Fitzgerald's construction he entirely overlooks the difference between radiant heat, which must be moving along given lines in a determinate direction, and other heat. The heat referred to as 'entangled in the space *m n*' is radiant heat alone. I have definitely traced its path, and shown that it does not move as Professor Wood states. Instead of regarding this fact, he has attributed to it the properties of heat as ordinarily existing in matter.

Professor Wood also refers to his papers in the *American engineer*, etc. The only point in that somewhat lengthily and personal discussion upon which I understand Professor Wood to finally insist, he republished in the *Journal of the Franklin institute* for May, 1883. In my reply in the same journal for June, 1883, I showed the fallacy of his objection. So far as I know, Professor Wood has taken no notice of that reply, and now completely ignores it. I may say that the proof he relied upon was of this nature. He proposed a certain construction or process (differing essentially from mine) for dealing with radiant heat, and one which would not accomplish the end sought. He then showed that his construction was a failure, and concluded that mine would therefore fail also, — a method of reasoning which seems to me inconclusive, to say the least. And now Professor Wood says that Mr. Fitzgerald's construction is 'conclusive.' All it is conclusive of is, that it will not accomplish the end which I have proposed: we all agree that it will not. I have shown, however, that my proposed construction differs from both in just those particulars necessary to make it accomplish the end sought.

It is unfortunate that the velocity of radiant heat is such as to render experimental verification a matter of great difficulty.

H. T. EDDY.