

As already announced by Prof. Rowland, it appears that the anode is as important in the matter as the cathode. We have a number of tubes which give results, but none better than the one mentioned, while a tube just received, of American manufacture, promises to equal the imported ones.

The success so far obtained with the arm and chest encourages us to think that still thicker portions of the human body may be studied advantageously, and experiments will be immediately undertaken in this direction.

DAYTON C. MILLER.

CASE SCHOOL OF APPLIED SCIENCE,

March 25, 1896.

[The photographs referred to by Prof. Miller, like all others of a similar character, are difficult of adequate reproduction by photogravure. The bones of the wrist and the large bones of the forearm are splendidly shown and the aluminum medal shows detail nearly as well as an ordinary direct photograph. T. C. M.]

THE INVERTED IMAGE ON THE RETINA.

I CANNOT justly take to myself the severe remarks which Prof. Brooks makes, in the last number of *SCIENCE*, concerning those who have understood him to mean that there is something peculiarly inconceivable in the *inversion* of the image on the retina; I did not myself take this view, because I happened to know, before writing my letter, that he disavowed this interpretation of his words. I even fail to understand by what rule of logic he drew the conclusion that he was the distinguished scientist to whom I alluded when I used these words: "Prof. Brooks can hardly hope that there should be any consensus among scientific men in regard to * * * * *consciousness*, if there are still distinguished scientists who think that there is anything which needs explanation in the fact that the image on the retina is inverted." (I add the italics now.) This view of the matter is not uncommon, as the following instances, in addition to the discussion which has been going on for more than six months in *SCIENCE*, and which Prof. Brooks has found so wearisome, will indicate. A physician who had been travelling among the Esquimaux recently reported

before a medical society in Philadelphia that those people are in the habit of holding a picture upside down when it is given them to look at; he accounted for this curious fact by supposing that they were in such a low state of development that they had not yet learned to reinvert the image on the retina, and this hypothesis was seriously discussed by this body of physicians, without having its absurdity pointed out by a single member. As another instance, I mention that a prominent Baltimore physician, in writing on the sensations of infants, lately said that they see everything upside down at first, and only learn afterwards to correct this impression.

Since Prof. Brooks has included me among those who have failed to take his meaning as he intended it, he cannot complain if I come to their defence in a single word. He had said: "We all believe many things that are inconceivable, such as the truth that the image in the retina is upside down;" and again, "I illustrated, by the inversion of the retinal image, the fact that evidence may furnish conclusive proof of truths that are inconceivable." Now, while it is true that "if, for purposes of illustration, I declare my conviction that the moon is not made of green cheese," no one has a right to infer that I think the moon is made of cheese of any kind, this supposititious assertion offers no analogy to the case in hand. If a person said that he could not believe that *the cheese of which the moon is made is green*, and also that he was not able to believe in the *greenness of the cheese of which the moon is made*, he would be using expressions precisely analogous to those made use of by Prof. Brooks in the case of the retinal image. Would anyone be expected to use language like this, unless it was the greenness only that troubled him?

C. L. F.

NECESSARY AND SUFFICIENT TESTS OF TRUTH.

EDITOR OF *SCIENCE*: When Prof. Brooks says that it is a 'great law of logic that the test of truth is evidence and not conceivability,' he uses the phrase 'test of truth' in a loose way which (while it is not uncommon), in the interests of logic, I must protest against.

To the mathematician it has long been a