sank to forty-eight in five minutes, and remained at that for some hours. The resistance offered by the body to an induced current was stated to be only half that offered to a continuous one. An ingenious speculation was hazarded as to the possibility of the human nervous system distantly resembling a duplexed telegraph-cable, in which a transmitted impulse is balanced and inhibited at the sending-station, but unbalanced and exhibited at the receiving-station. W.

London, April 13.

NOTES AND NEWS.

THE following, in addition to those given in our last issue, completes the list of papers read at the National academy of sciences, April 20 – 23: Alfred M. Mayer, On the diathermancy of ebonite and obsidian, and on the production of calorescence by means of screens of ebonite and obsidian; On the coefficient of expansion of ebonite; On the determination of the cubical expansion of a solid by a method which does not require calibration of vessels, weighings, or linear measure; On measures of absolute radiation; E. D. Cope, On the geology of the region near Zacualtipan, Hidalgo, Mexico; Edward S. Morse, On ancient and modern methods of arrow release; Theo. Gill, The ordinal and super-ordinal groups of fishes; H. A. Rowland, On the absolute and relative wave-lengths of the lines of the solar spectrum; Wolcott Gibbs, Platinous compounds as additive molecules; Ira Remsen, Influence of magnetism on chemical action; A. Graham Bell, Upon the deaf and dumb of Martha's Vineyard (continuation of research relating to the ancestry of the deaf); S. P. Langley, On the invisible spectra; G. F. Becker, Cretaceous metamorphic rocks of California (by invitation); Ogden N. Rood, On color contrast; Charles D. Walcott, Classification of the Cambrian system of North America (by invitation); A. W. Wright, Crystallization of platinum by means of the electric discharge *in vacuo;* W. K. Brooks, The Stomatopoda of the Challenger collection; Budding in the Tunicata; A. W. Wright, Effect of magnetization on the electrical resistance of metals; R. E. Peary, U.S.N., On a proposed expedition into the interior of Greenland.

LETTERS TO THE EDITOR.

Science at Cornell.

MY attention has been called to the communication signed 'H. N.' in *Science* for April 16, and I beg for a little space in which to point out one or two errors into which the writer has fallen.

I shall not attempt to deal with the swarming misstatements and exaggerations of the letter. These, although inviting game, are comparatively unimportant. But the fundamental idea of the writer is not without importance, and therefore should not pass unnoticed. That idea is divisible into two parts. The first is, that Cornell university, in developing its non-technical side, is doing violence to the fundamental law and charter of the institution; and the second is, that, in so doing, 'the successor of Andrew D. White' is reversing the traditions and former policy of the university. "Where," exclaims the writer, "are the traditions and the law and charter of Cornell?" Let us see.

First, The fundamental law declares its purpose in the words, "in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." To accomplish this declared purpose, which, it will be seen, is of the broadest possible character, the law required "the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts." How this shall be done is explained in the clause, "in such manner as the legislatures of the states shall respectively prescribe."

Here we see, in the language of the law itself, a purpose that is clearly unmistakable. It includes not simply agriculture and the mechanic arts, but 'other scientific and classical studies,' 'military tactics,' and 'the several pursuits and professions of life.' Furthermore, these provisions shall be carried out in such a way as the legislatures of the states may severally prescribe. So much for the fundamental law.

Second, The charter of the university, after repeating the provisions of the fundamental law, and doubtless in view of the very large gift of Mr. Cornell, adds the following sentence: "But such other branches of science and knowledge may be embraced in the plan of instruction and investigation, pertaining to the university, *as the trustees may deem useful and proper.*" In other words, the trustees are left by the charter to determine precisely what branches of science and knowledge shall be embraced in the plan of instruction, after those specifically provided for have been established and duly equipped.

Third, Now as to traditions. As soon as the trustees named in the charter came together, the first thing to be done was to determine upon a plan of organization. A committee for that purpose was appointed, of which Andrew D. White was chairman. On the 21st of October, 1866, he presented his famous report. In the very first part of it, under the head of 'Fundamental plan of instruction,' he argues the very question which lies at the bottom of 'H. N.'s' grievance. He is of opinion that the fundamental law justifies the establishment of all the departments of a true university. But, even if it did not, he finds unmistakable warrant in the provisions of the charter. In order that there may be no possible misunderstanding of President White's views, I quote a single sentence from p. 4 of the report: "Even if it should be claimed that the whole effort of the trustees ought to be devoted to agriculture and the mechanic arts alone; even if we were to construe away the plain words of the original act of congress, which speaks of 'other scientific and classical branches' as part of the object of the government grant of lands, — still the oft-repeated declaration of our founder, that he 'wishes to make such provision that every person can find opportunity here to pursue any study he desires,' would be our

sufficient warrant in using at least his munificent gift in supplementing the special instruction with general instruction, and rounding it out into the proportions of a university."

Now, proceeding on this theory, under the head of 'Organization,' President White gives a list of the departments which he thinks ought to be established. Conspicuous in this list, on p. 5 of the report, is the department of medicine and surgery, and the department of law. Then on p. 13 of the same report I find, in the list of professors, the appointment of whom he recommends, — a 'professor of municipal law,' and a 'professor of constitutional law.' For the purposes of this presentation it is, of course, needless to speak of the other departments contemplated in the plan of organization.

Now, I have read all the speeches, and I believe all the reports, of President White; and I believe there is not a passage in one of them, from first to last, that contradicts, either in letter or in spirit, the doctrine here set forth. I will go further, and say that through them all is to be seen the same spirit as that manifested in the 'plan of organization.' This is my answer to 'H. N.'s' grandiloquent inquiry, "Where are the traditions and the law and charter of Cornell?"

It has never been claimed, and is not now claimed, that the technical departments are of secondary importance; but, as I asserted in my address at New York, I hold that these departments have now so far been provided for, that the time has arrived when attention should be called to the needs of other departments. I do not mean by this that the university is to cease its appropriations for the technical schools. So far as I know, it has no such intention. This, indeed, may fairly be inferred from the fact that at the present moment the trustees are taking steps for the immediate erection of an ample building for the veterinary department, and to add four rooms to the agricultural museum. We shall do still more in the same direction, but it is not the purpose of the trustees to limit the activities of the university to a single one of those interests, comtemplated at the time of its organization, and, indeed, throughout its history.

No revolution is taking place at Cornell. On the contrary, its trustees are trying to develop it strictly along the line of its fundamental law, its charter, and its traditions. Surely it is late in the day for this university to be turned from such a purpose by any hint that its charter is in danger.

C. K. ADAMS.

Cornell university, April 26.

Popular astronomy.

I think the author of the article 'Popular astronomy' (*Science*, April 23), in his chivalric defence of the rights of Professor Newcomb and myself, has really done a serious injustice to Dr. Ball in virtually charging him with deliberate plagiarism and "a continued effort to conceal the theft, which is petty in the extreme," by slight alterations of the borrowed material. No one personally acquainted with Dr. Ball could possibly suspect him of intentional wrong in the case: I believe him to be totally incapable of any thing dishonorable.

Judging from my own experience, which, though not extensive, has been exactly to the point, a very simple explanation will account for the apparent appropriation of other people's language, which is the foundation of the charge. In preparing for lectures to college classes and to popular audiences, I collect all the material I can find, and, in speaking, use it liberally. Of course, I indicate in a general way my obligations and sources of information; but it is quite impossible, while speaking, to point out every place where I am using language suggested by my reading. In fact, not having the matter written out, it is not possible (for me at least) to quote accurately the words of my authority; and, after a few repetitions of the lecture, the *quasi* quotations become modified by changes that make them conform to my usual forms of expression, and render them, so far as consciousness is concerned, quite as much my own as any other part of the lecture. At the same time they would be quite recognizable by one familiar with the original.

Now, in making a book upon the subject upon which one has been lecturing, he will inevitably write pretty nearly what he would say if standing before an audience, and in this way will quote, unconsciously and more or less inaccurately, passages of considerable length from the works he used in his original lecture-preparation. The only way I know of to do justice in the matter, is first to put into the preface of the book a full general acknowledgment of obligations, and then to go over the manuscript, lecture-notes in hand, hunting up and marking all these unconscious quotations, and restoring them to their original form.

Dr. Ball seems to have failed in doing this thoroughly, and hence, no doubt, the oversights which have led to the charge of guiltily disguised plagiarism. I am sure he meant no wrong, and I am greatly complimented and flattered by his approval and use of my work.

C. A. YOUNG.

Princeton, N.J., April 24.

As Sir Robert Ball is on the other side of the Atlantic, I deem it proper to say that he has satisfactorily explained the circumstances alluded to in the last number of *Science*. Although this explanation only refers to the copying of passages from my 'Popular astronomy,' I have no doubt that his remarks would apply equally to the close parallelism of passages in his book, and in Professor Young's treatise on the sun. His statement is as follows: —

"Your sketch of the discovery of the companion of Sirius I transcribed some years ago, before I had any thoughts of writing my book. The passage about Tycho I had, however, more recently taken. When I came to prepare the materials for the press, I lost sight, it seems, of the source of these passages, and treated them as if the language had been my own.

"Not until yesterday, when I read the review in the New York *Nation*, did I know that my book contained any passage virtually yours, except that duly acknowledged on p. 231."

I suppose this is an inadvertence of which any of us might be guilty who are in the habit of copying passages for use in popular lectures, or as memoranda for any other purpose.

S. NEWCOMB.

Arsenic in wall-paper.

A note in *Science* (April 23, p. 371) says, "The investigation before the Massachusetts legislative committee on the subject of arsenic in wall-paper indi-