

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, contemplated 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-

cates that the danger has been exaggerated." So far is this from being the case, and so great is the real danger, that I beg space for the presentation of some facts. The immediate cause of the present investigation was a letter published in the *Boston Herald* on Jan. 19, in which I gave a detailed account of sufferings in our own house due to arsenic in the wall-papers, and involving all the members of the household. Since that time many persons have published similar accounts in the Boston papers. Abstracts of twenty-two such letters appeared in the *Boston Advertiser* of March 2 and 12, fourteen of the same appearing in the *Boston Herald* of March 2; and in the four hearings given by the public health committee to the petitioners a mass of evidence was presented which must have convinced any unprejudiced mind. The committee have not yet made their report to the legislature, but it is expected that they will soon do so. The statement has already been published in the Boston papers, that the committee will recommend legislation, and it would be a matter of great surprise if they should do otherwise,—a surprise even to those who are trying to defeat legislation.

*Science* also adds, "Prof. C. F. Chandler testified, that, from careful experiments, under no conditions could arsenical poisoning occur through breathing arseniuretted hydrogen from wall-paper, and that the only source of danger would be from friction alone." In point of fact, Professor Chandler's testimony was much stronger than this. He not only stated that he believed the generation of arseniuretted hydrogen from arsenical wall-papers to be impossible, but he also said of this gas that he considered 'a small quantity comparatively harmless.' As to the legislation, for which those of us who have suffered were asking, he said that he was 'not in favor of any law on the subject;' that personally he was 'not afraid of arsenical wall-paper under any circumstances, with any quantity;' and that he considered the evidence of persons who suppose that they have suffered from wall-paper poison to be 'of very little value.' He also said that some years ago he investigated the whole subject of dangers from arsenical wall-papers, 'and concluded that there was nothing in it;' while his conviction that the generation of arseniuretted hydrogen from arsenical wall-papers is impossible was based on experiments made by two of his students in his laboratory six years ago.

As to all the essential points involved in the investigation, the petition is supported by the best chemical opinion in Harvard university, by some of the best medical opinion in Massachusetts, and by a body of evidence from actual sufferers unimpeachable and unanswerable. But I desire specially to call attention to the fact that Professor Chandler himself gives indirect support to the petition. As one of the original editors of Johnson's 'Universal cyclopaedia,' and one of the active editors in the revision now going through the press, Professor Chandler publishes in vol. i. (New York, 1886) an article on arsenious oxide, wherein he calls attention to the danger from arsenical paper. His language is, "Recent inquiry would lead to the belief that rooms covered with paper coated with this green arsenite of copper are detrimental to health, from the readiness with which minute particles of the poisonous pigment are detached from the walls by the slightest friction, are diffused through the room, and ultimately pass into the animal system. It is also said that arseniuretted hydrogen ( $H_2As$ ), a very poisonous gas, is generated in damp weather."

retted hydrogen ( $H_2As$ ), a very poisonous gas, is generated in damp weather."

True, this language was first written for an earlier edition; but inasmuch as no expense was spared in the revision (see publisher's announcement), and inasmuch as Professor Chandler was one of the revisers, the language may be taken as the utterance of all that Professor Chandler considered it worth while to say at the time when the new volume was published. I have called this article an 'indirect support' to our petition, because, although the writer does not squarely state an opinion of his own, yet his language undoubtedly makes the impression that he considers the subject an important one,—one, indeed, which he has not investigated, and on which he therefore has not formed an opinion, but important enough to call attention to the danger.

It is also interesting to observe that one of the authorities whom Professor Chandler quotes against the theory that arseniuretted hydrogen escapes from arsenical wall-papers has subsequently changed his opinion. I refer to Watts's 'Dictionary of chemistry.' So far as I have been able to learn, the last expression of Dr. Watts on the subject in hand is found in the third supplement, which is vol. viii. of the whole work, in part i. p. 122 (London, 1879). There we read, "*Arsenic in the air of rooms.*—From experiments by H. Fleck (*Zeitschr. für biologie*, viii. 444), it appears that the air of rooms, the carpets or wall-papers of which are colored with Schweinfurth green, often contains arseniuretted hydrogen, produced by the action of moisture and organic matter on the arsenical pigment. The size, starch, paste, etc., used in hanging the paper, appear to be especially active in this respect."

Also another authority, whose opinion of 1862 Professor Chandler quotes against our petition, has long since given up that opinion. I refer to Dr. Hoffman of Berlin. Dr. Hoffman was one of the scientific men summoned a few years ago to aid the German royal sanitary commission in investigating the dangers from arsenic in objects of domestic use. Dr. Hoffman's present opinion is seen in the report of the commission, which resulted in a stringent law in Germany. The language bearing on this subject is as follows: "Wall-papers are deserving special attention, and also window-curtains, which frequently contain large amounts of arsenic. The injurious action of this is not only through the lading of the atmosphere with arsenical dust, but also from the continued formation of arseniuretted hydrogen, a gas extremely dangerous to health."

I am happy to state that the public health committee of the Massachusetts legislature have ordered the publication of the stenographic report of the hearings given on this subject, and this document cannot fail to be of value to the legislative committees of other states or of congress when the enormity of the arsenic evil shall become more widely known.

D. G. LYON.

Cambridge, Mass., April 24.

#### On two plates of stratigraphical sections of the Taconic ranges by Prof. James Hall.

In an article in the number for April, 1886, of *The American journal of science*, entitled 'On lower Silurian fossils from a limestone of the original Taconic of Emmons,' on p. 247, the author speaks of