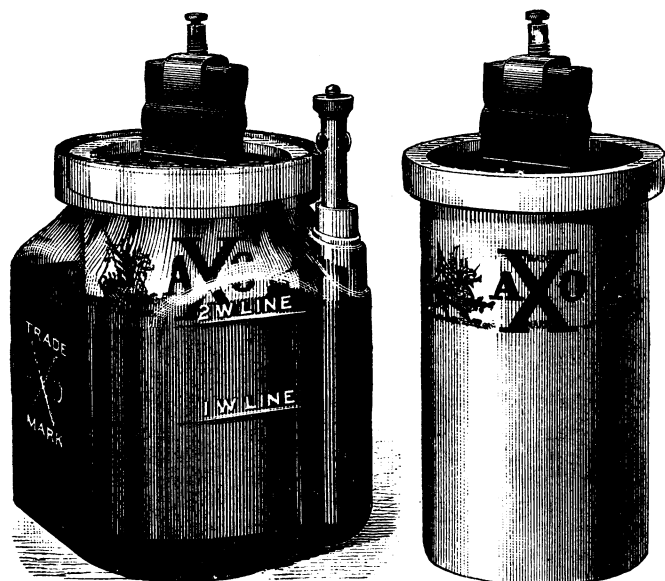


behind men with the beam of light on a target, very good practice can be made, so long as the men are in the beam, the sights of the guns then being illuminated; if, however, the men are out of the beam, and consequently invisible, the accuracy of the practice is much reduced.

THE AXO BATTERY.—The most widely used galvanic cell for "open-circuit" work—that is, for bells, burglar-alarms, telephones, etc., where the current is only taken out for short times—is the Leclanché, or some of its modifications. The cell has many advantages: it needs very little attention, its electro-motive force is comparatively high, there is no eating-away of the zinc when the cell is not working. The only troubles have been in the evaporation of the liquid, the creeping of the solution over the edges of the jar, and the corrosion of the



binding-post contact at the carbon pole. These defects are remedied in the new Axo type of Leclanché cell shown by the illustrations. Here the porous cup forms of itself the cover of the cell, which is hermetically sealed by pouring wax or paraffine in the space between the top of the cup and the edge of the jar. As the depolarization of the battery requires that there be a certain amount of ventilation, this is secured by deep grooves in the sides of the carbon, coming above the cover of the jar. It will be seen that the zinc passes through a separate hole in the side of the jar, which is closed by a rubber stopper. The connection with the carbon is made by a patented metallic clamp and thumb-screw, shown in the figure. Taken altogether, the Axo is an advance in galvanic cells. It can be sealed and left to itself, until, as must finally happen in every battery, the zinc and solution have to be replaced, when with very little trouble it can be practically renewed. For ordinary bell-work it would probably last a year or more without attention.

NOTES AND NEWS.

PROFESSOR SHALER of Harvard has returned from his tour of geological exploration through the Dismal Swamp.

—The Rev. Dr. George E. Reed, pastor of the Trinity Methodist Church of New Haven, is now at work upon his letter of acceptance as president of Dickinson College of Carlisle, Penn.

—Mr. F. Küstner has made a very interesting series of observations on the aberration of fixed stars, and, from certain discrepancies between early observations made by Struve and recent ones made by himself, arrives at the conclusion that the altitude of the pole, which is assumed to be a constant in the formula applied, is in fact variable. He found that in the fall of 1884, at Berlin, the polar altitude must have been 0.2" greater than before and after that season. As this result appeared somewhat startling, he subjected other observations made at Pulkowa and Gotha to a thorough investigation, which proved the correctness of his view. Mr. Küstner

attributes these variations to meteorological and hydrological phenomena which are caused by the action of the sun. Helmholtz's investigations tended to show that these irregular movements of matter might result in changes of latitude not exceeding a few hundredths of a second, while William Thomson concluded that these changes might be as great as half a second. From Küstner's observations, it appears that the real changes are intermediate between these two values.

—Professor Hill of the School of Geology of the University of Texas plans the establishment at the university of an educational museum which will represent in the broadest sense the geologic conditions—structural, economic, organic, and general—of the earth, and to illustrate these features as far as possible by Texas material accompanied by maps, models, and labels. This museum will exhibit not merely the extraordinary, but also the far more important and too little valued ordinary features of that State; so that any person, citizen or stranger, will find compactly arranged in the halls of the university a complete and instructive synoptical exhibit of all the diverse natural features of Texas. The museum will also be a medium of exchange with similar institutions outside the State. The attention which will be attracted abroad by properly prepared and representative specimens from Texas, conveying clear and accurate scientific information that can be disseminated in no other manner, will attract the earnest interest of a class of intelligent people who cannot be otherwise reached. The functions of the museum will also be distributive as well as collective, and its utility not confined to the university building, but disseminated throughout the State, it being the intention to select from its duplicates typical educational series for distribution to high schools connected with the university wherein the natural sciences are taught.

—A movement has been started in Norway, says *Nature*, for the despatch in the summer of 1890 of an expedition which will try to reach the north pole, and it is proposed that the leadership shall be offered to Dr. Nansen. Those who are arranging the plans maintain that no other country could furnish such a crew of experienced and hardy ice-men and arctic travellers as Norway, and that a winter or two in the arctic regions would affect these men very little. The intention is that an attempt shall be made to reach the pole by way of Franz Josef's Land,—a route advocated by the most experienced Norwegian arctic travellers as well as by several well-known men of science who have studied the problem. *Ski*, which have played such a prominent part in the Norden-skiöld and Nansen Greenland expeditions, would no doubt again be of great service.

—The board of overseers of Harvard College, at a meeting held Jan 30, adopted, after prolonged discussion, the following vote: "Voted, that, in the opinion of this board, it is expedient that every undergraduate be requested to report in person early every morning, with a moderate and fixed allowance for occasional absences; that attendance at the exercises of each course be more rigidly enforced; that the system of advisers, somewhat as applied to special students, be extended to the freshman class; that the reports of the presence and absence of students be collected daily by monitors, and daily entered on the books; that no choice of studies made by a student be valid if it calls for more than three lectures or recitations on any day of the week, unless the choice has been specially allowed by the dean; that, in order to make it more difficult for students to prepare by a brief period of cramming to meet the tests applied, the faculty require all the instructors to provide tests of the progress of their students with sufficient frequency to enable them to enforce effectively Section 7 of the Regulations; that admonition be administered by the dean on his sole authority, and that the powers of that officer be so enlarged, at whatever increased expense it may be necessary to incur, that the records of attendance may always be ready for inspection by the proper officers; that the faculty be asked to prepare and report a series of rules, which, in their judgment, will give practical effect to these recommendations." This was adopted by a vote of 16 yeas to 4 nays, those voting in the negative being President Eliot, Dr. Phillips Brooks, Dr. Walcott, and Charles R. Codman. The carrying-out of these recommendations will depend on the faculty, which, it is understood, are opposed to their spirit.