least exposure giving a good negative in the dark-room. This factor can certainly be trebled. A plate having any intermediate exposure can be developed either as a good positive in the light, or as a good negative in the dark-room.

It was stated that the best results with plates near the zero condition had been reached with a rather strong bath, with two drops of saturated hypo to the ounce of bath.

Three persons were elected to active membership.

William Trelease,
Recording Secretary.

SCIENCE CLUB OF THE UNIVERSITY OF WISCONSIN.

The January meeting of the Club was held on the evening of the 24th inst., President Birge in the chair. Professor J. M. Coulter, of the University of Chicago, delivered his address on 'The Teaching of Science' (substantially as published in this Journal, Vol. XII., p. 281). At the close the president related an incident from his own early experience to show how completely scientific education was misunderstood by the classicists, and he expressed the opinion that the quality of science teaching in the universities is not so poor as Professor Coulter would have us believe. The president extended the very evident thanks of the audience to the speaker for his address.

E. R. Maurer,
Secretary.

DISCUSSION AND CORRESPONDENCE.

THE SIDGWICK MEMORIAL.

To the Editor of Science: I have been asked to act in America for the English committee on a memorial to the late Professor Henry Sidgwick. Other Americans are probably acting also, but of this I do not know. A meeting in the interests of such a memorial was recently held at Cambridge, and an influential committee was appointed. The memorial will probably take the form of an endowed scholarship at Cambridge, though other projects are also before the committee. Seeing the services Sidgwick rendered to education—notably woman's education—and the very large use made of his books in American universities, it is hoped that a considerable sum will be raised in this country. Contributions, to be forwarded through me, may be sent direct to Princeton, New Jersey.

J. Mark Baldwin.

SHORTER ARTICLES.

RADIO-ACTIVE MINERALS.

In searching for radio-active substances with one of Professor Rood's new electrometers, an instrument particularly well adapted to the purpose, several minerals not hitherto noted were found to be radio-active. Professor Rood suggested that I should try columbite, and gave me some specimens. The electrometer immediately shows that the air in the neighborhood of the mineral is ionized, and later photographic tests confirm the radio-activity of columbite. A chemical analysis of the specimens has not yet been made, but according to Dana, columbite does not contain uranium or thorium.

Specimens of erbium oxide and niobium oxide, from the museum of the chemical department, also show with the electrometer a slight ionizing effect. Further investigations are being made.

Geo. B. Pegram.

Physical Laboratory of Columbia University, January 26, 1901.

THE MUSICAL BOW IN CALIFORNIA.

In view of the present discussion in regard to the existence of the musical bow in America, and of its independent development on this continent, the occurrence (quite rare at present, however,) of a form of this instrument among the Maidu Indians of Northern California appears worthy of a brief note.

The bow as used by the Maidu is a simple bow of cedar, some 2½ feet in length, at present strung with wire, but formerly with a fine sinew cord. In playing the instrument it is held in the left hand (the hand grasping the center of the bow, thumb inside and palm facing forward), the bow extending horizontally to the left. The right-hand end of the bow is placed in the open mouth, and the bow string tapped rapidly with a small flexible twig held in the right hand. By varying the size of the resonance chamber (the mouth) with the aid of the tongue, and by opening or closing the mouth to a greater or

less extent, notes are produced as in a Jew's harp. The tones are, however, very faint, and are audible only at a short distance.

The use of this bow, known as 'kāwotöne panda,' is restricted to the medicine-men or shamans, and other persons are rarely allowed to see and never allowed to touch the instrument. The sacredness of this bow, the fact that it is used by the medicine-men only in communicating with and praying to the 'kukini' or spirits, and that its manufacture is accompanied by ceremonial observances, including the rubbing of the bow with human blood—all seem to point to the bow as being of native origin. The limited contact of these Indians with the negro, and the place held by the instrument in the religious life of the people, here as well as elsewhere in America, would seem to militate against the view that the musical bow is on this continent the result of acculturation.

ROLAND B. DIXON.

CURRENT NOTES ON PHYSIOGRAPHY.

THE YOSEMITE VALLEY.

A CAREFUL study of 'the Pleistocene Geology of the south central Sierra Nevada with especial reference to the origin of the Yosemite valley,' by H. W. Turner (*Proc. Cal. Acad. Sci.*, 3d ser., Geology, i, 1900, 261–321, 8 pl.) is of much interest, but still leaves this interesting problem without definite solution. The suggestion that the valley is a *graben* is discarded, yet direct proof or disproof of this view can be gained only when identifiable structures are found in the rocks of the valley floor and of the uplands, as has been done in the case of the Rhine *graben*. It is concluded that 'the canyons of the Sierra Nevada, like most other canyons the world over, were formed in the main by river erosion'; but it is suggested that after a rather extended glaciation of the Sierra highlands, narrow and deep canyons were cut in an interglacial epoch, and that ice streams of a second glacial epoch 'greatly modified the new-cut canyons of the interglacial epoch, and gave them, within the glaciated area, substantially their present form.' The contrast between the broad U-shaped section of the Yosemite and the sharp V-shape of the Merced canyon farther west seems to favor this view. Moraines are found on the valley floor at six points, the westernmost being where the open valley ends and the V-canyon of the Merced begins; it is pointed out that the size of the moraines would be greater if their bases were not generally buried in river sands and silts.

Gannett, commenting on Turner's article, forcibly maintains the glacial origin of the Yosemite, appealing especially to its hanging lateral valleys in support of his opinion (*Geogr. Mag.*, XII., 1901, 86–87).

PATAGONIA.

THE geographical results of the Princeton expeditions to Patagonia are presented by Hatcher in most interesting form. ('Some geographic features of southern Patagonia, with a discussion of their origin,' *Nat. Geogr. Mag.*, xi, 1900, 41–55.) The eastern coast shows a line of sea cliffs, from 300 to 500 feet high, seldom broken except at river mouths where the few harbors are found. The strata in the cliffs are nearly horizontal, but by following them for long distances two marine formations separated by a continental formation are discovered, all being covered by 20 or 30 feet of unstratified boulders and clays, the great shingle formation, of glacial and aqueous origin. Vast plains stretch inland from the coast, subarid, bearing thin grass and scattered bushes; guanacos and rheas are found here in abundance. The plains are broken by escarpments, often several hundred feet high, trending north and south, and interpreted as sea cliffs formed during the latest emergence of the region. Recent lavas cover considerable areas in the central interior, forming scoriaceous plains of large extent, here and there dissected by canyons. Indeed, all these features are broken by the valleys of rivers coming from the back country. One of these valleys, that of San Julian, has at present no stream; its waters having been captured by a northern tributary of the Santa Cruz, 100 miles in from the coast. Numerous depressions holding small salt lakes are interpreted as remnants of an ancient valley system, now masked by deposits formed during the last submergence of the region. The district pied mont to the Andes is sheeted with morainic