

impact. The ball is *flattened* against the club-face, and is for the time prevented from revolving. To assist the grip of the club on the ball, lines are scored over the surface of the ball. Now consider the effect of the rotation of the club-head round the centre of percussion when the ball goes off the heel or the toe.

The following diagrams of a "toed" ball will best explain my meaning—

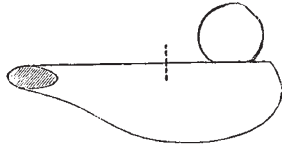


FIG. 1.

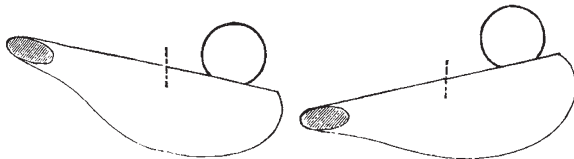


FIG. 2.

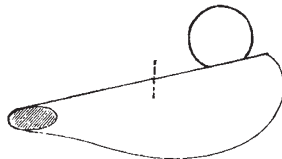


FIG. 3.

FIG. 1 shows the club-head and ball on first meeting.
FIG. 2 shows the backward revolution of the club-head due to the impact of the ball on the "toe" of the club.
FIG. 3 shows the club-head on the recovery before the ball leaves the club-face.

It is quite evident that during the movement from the position shown in Fig. 2 to that in Fig. 3 the ball, though adherent to the club-face, is revolving to the left on its own axis at the same rate as the club-head on its axis. This is the direction of spin that curves the ball to the left, or "toes" it. The opposite happens in a "heeled" ball. This rotary movement is necessarily intensified by the involuntary reaction of the wrists, which brings the club-head further round than the elastic recovery of the shaft alone would do.

I venture to think that this is the true explanation of "heeling" and "toeing." The same effects can be produced in other ways; "heeling" may be imitated by "slicing," but that does none the more make it "heeling," nor must we generalize from what happens in bad play, for then—as I know to my cost—all things are possible.

T. MELLARD READE.

Park Corner, Blundellsands, October 22.

The Ffynnon Beuno and Cae Gwyn Caves.

THE letter from Mr. Worthington G. Smith in the last number of NATURE (p. 7) affords a remarkable instance of rushing into print and giving an opinion on a subject with which the writer is unacquainted. Speaking of the deposits in the caves, he states that all he knows about the matter has been derived from reading a very short abstract of a paper read by Dr. Hicks at the recent meeting of the British Association, in which the caves are referred to. Now, so much has been written and published on the Ffynnon Beuno and Cae Gwyn Caves in NATURE and other scientific publications, that it is extraordinary that anyone should venture to offer an opinion without previously reading up the literature of the subject. Mr. Worthington G. Smith states that he has visited the caves, and is fairly well acquainted with the Glacial deposits of North Wales and with Palæolithic implements in general, and that his "unbiased opinion is, and will so remain—unless" he gets "very convincing proof to the contrary—that the drift at the caves has been without doubt relaid." We may be thankful for Mr. Smith's opinion, but unfortunately it is not worth anything, as his letter conclusively proves. Although his opinion is of no consequence, I think it should not pass unnoticed, and it affords me an opportunity of stating that during the last month the drift about the entrance of the Cae Gwyn Cave has been again carefully examined, and that the Reports of the British Association Committee have been fully confirmed.

G. H. MORTON.

Liverpool.

THE VICTORIA UNIVERSITY.

WE are glad to observe that the application of the Yorkshire College for admission to the Victoria University has been successful. Doubt was expressed by some members of the Court as to whether the Faculty of Arts in the Leeds institution was strong enough to justify its claim to share in the privileges enjoyed by Manchester and Liverpool. This doubt was overruled. The Charter requires that the provision for teaching both arts and sciences in a College must be "reasonably sufficient" before it can be admitted to the University. It is not, however, intended that it must be equally developed in both directions. The Yorkshire College is no doubt stronger on the scientific side, and was indeed originally called the "Yorkshire College of Science." The name was changed, and the limitation it implied removed, two years after its foundation, when the Council formally took over the classes in literature and history previously carried on by the Cambridge University Extension.

The subjects of a curriculum in Arts are now taught, though the number of Professors engaged in the task is less than could be wished. The Professor of Classics is Principal, and representative of his scientific as of his Arts colleagues on the Council. There is a Professor of English Literature and History, and there are Lecturers in French, German, Italian, and some Oriental languages. An institution which provides a staff competent to teach these subjects, and places its Professor of Classics at its head, cannot be accused of an undue preference for science, and is, we think, fully qualified under the terms of the Charter.

One of the advantages of the federation of local Colleges in a University is that members of their governing bodies will be brought together in its management, and will thus learn practically what is being done in other institutions. Leeds will no doubt be stimulated to attempt to bring its Arts Faculty to the level attained by Manchester. Manchester may learn that combined classes for both sexes are practicable, and that the addition of a Faculty of Technology to those of Arts and Science may be of advantage to all concerned.

The Victoria University is now fairly started on its career, and its constituent Colleges have their future in their own hands. Manchester, Liverpool, and Leeds can confer degrees on students in their principal educational institutions untrammelled by the requirements of any external authority. We believe that this experiment is more promising than an attempt to subordinate local Colleges to our older Universities. Oxford and Cambridge have traditions and peculiarities which those who know them best would wish to survive amid the changes which are from time to time necessary to bring them into harmony with the spirit of the age. Had a close union been formed between these Universities and the local Colleges, it is probable that the Colleges would gradually have destroyed much that in its place in the Universities is useful, or that the Universities would have checked the growth of the Colleges by insisting on the attempt to fulfil conditions which in a manufacturing town are unattainable.

However this may be, it is certain that the most successful provincial Colleges have achieved success without direct connection with Oxford or Cambridge, though from the fact that graduates of these Universities are always to be found on the Professorial Staff they have exercised an indirect and no doubt useful influence.

If the Victoria University succeeds in combining the love of knowledge for its own sake with a readiness to meet the practical requirements of an age in which success in commerce and in learning are closely related, it may acquire a prestige and an authority second to that of no other educational institution in the country.