bottom, or to the stage of the tide or the conditions of wind and weather. It seems reasonable, therefore, to regard the undertow as a somewhat imaginary quantity, the supposed occurrence of which depends largely on the excited sensations of poor swimmers. The fact that floating objects are not ordinarily carried in towards a beach suffices to show that no persistent under-current can be moving outward from it. Let it be understood, however, that a very real out-going movement takes place under the up-rush of the water from a breaking wave upon a sloping beach, for this is the compensating reflux of the preceding up-rush; but it is little felt outside of the line of breakers. Let it be noted also that, next outside of the breakers, the normal water movement of the water in a wave trough is outward; and that this movement is faster at the surface than at the bottom and that it is reversed to a shoreward movement when the next swell arrives. It has no significant under-dragging power. A real undertow should not be confused with these ordinary, systematic movements.

Now as to "rip tides." In the first place they are not to be confounded with "tide rips," such as are commonly seen in the waters around Cape Cod; for tide rips are simply standing waves caused by rather strong tidal currents running over a shallow bottom and increased by an opposing wind. Rip tides are something else, and they are regarded as extremely dangerous to swimmers at the above-named Long Beach; but just what they are is about as difficult to learn as to discover what the mythical undertow is. A recent number of the Los Angeles *Examiner* reproduced what is called an "amazing photo of a rip tide at one of the beaches" without specification of the locality; but the picture is so vague that little can be made of it, except that it shows a whitish patch as if of foaming surface water in the otherwise darker water. The accompanying text states that "the danger spots are rip tides—deep gullies between pairs of whirlpools—caused by winter storms. When the tide is going out, these have terrific dragging force and cast swimmers into the eddies. . . . Nearly all the beaches have rip tides at this equinoctial season, and bathers are advised to consult life guards before entering the water." If a bather is caught in a rip tide he is advised to swim with it, not against it, for he will then be "carried in a curving line back into shallow water."

From other reports that I have read there is no question that the Long Beach rip tides are fraught with danger, but their real nature remains obscure. If the above account of them is taken literally, a rip tide is not a current of water but a "deep gully between a pair of whirlpools, caused by winter storms." Moreover, "these [deep gullies?] have terrific dragging force and cast swimmers into the eddies"; yet a few lines farther on a swimmer is advised to swim with the rip tide, and thus "be carried in a curving line," not into an eddy or gully of terrific dragging force, but "back into shallow water." These irreconcilable statements are fair examples of what is commonly told about undertow as well as about rip tides. Surely, rip tides can not be excavations in the shallow sea floor caused by the storms of a preceding winter; they must be currents, probably of more or less curving, possibly of whirling or vorticular flow; and if such currents really have the terrific dragging force that is attributed to them, they and not the storms of a preceding winter may excavate the deep gullies that are said to be associated with them.

The shore at Long Beach is a long curve concave to the Pacific on the south; it has been cut back in several low bluffs of weak sandy strata, and its beach has been built across two or more shallow intervening embayments under the action of a west-moving backset current, driven by the dominant southeastward current which is there held off shore by the peninsular promontory of San Pedro, farther west. The bottom deepens slowly, so that bathers may wade some distance from the beach before they have to swim. Motor boats are not rare thereabouts and it would seem that they might be easily used to determine just what a rip tide really is; but I have not been able to discover that any such study has thus far been made. A life guard whom I questioned on the beach during a brief visit two summers ago could give no clear account of what takes place when a rip tide is seen, or of the conditions which control its occurrence. Can any reader of SCIENCE give a clear account of these curious phenomena? Are they known and feared on other coasts, like that of Texas and New Jersey, as well as of southern California? Accurate information is much desired. My address from April to August will be 1351 Byron St., Palo Alto, Calif.

W. M. DAVIS

PALO ALTO, CALIFORNIA

NEW MASTODON FINDS IN EUROPEAN TURKEY

THIS note is a preliminary paper sent in now because it is all that can be done at present. Notes, photos and maps are available, and it is expected that a fuller account of the discoveries will be prepared for the *American Journal of Science* within the year, after the author returns home.

About twelve and fifteen miles west of Istanbul are two bays, Large and Small Chekmedje, drowned valleys, carved by streams since the last larger uplift of the region. The railroad from Sofia to Istanbul

nearly touches the head of each bay and follows the east side of Kuchuk Chekmedje its entire length as it comes down nearly to sea-level to enter the city. The stream coming into the latter bay from the north apparently was a part of a cavern or subterranean system. Its roof has collapsed, but four of its tributaries are still "lost streams," two on the west emerging from caves separately, and two on the east coming out at present essentially together.

The caverns on the east were human habitations and three burial sites are known on the slopes north of the cave mouths. Much more exploration is necessary before much of the truth in this matter can be written.

Farther south and between the two embayments in at least six localities, mastodon and other animal remains are found. The places are scattered over an area more than a mile north and south and nearly a mile east and west. The eastern bay has a western thumb and four of the localities are nearly in a line north from the thumb while the other two are between the thumb and the bay itself.

The parts known are not numerous but consist of 10 pieces. One is a mastodon tooth about 7 inches, front to back, 2½ inches wide and more than 6 inches high. Three tubercles of the tooth are worn through the enamel by use, but the fourth is still rounded. A second is a patella 3 inches across and much corroded. The third is a piece of tusk somewhat flattened and presenting a cross-section of about 4 by 6 inches. The layers show very clearly and are concentric round the nerve duct. This piece is more than one foot long, nearly white and clean. The other pieces are fragments of bone, apparently legs and ribs, and may not all belong to mastodons.

The discovery of these bones is due to the activities of Dr. Fikri Servet, a Turkish physician practicing in Galata Istanbul at Rasim Pasha Han 15–17. The doctor is a fine scholarly man and desires to collect farther and explore the cave more completely. He has done some excellent work so far and has given publicity in Arabic to some parts of his findings. He was anxious that a note be printed in English and this preliminary paper is in response to his request. Dr. Servet can be reached direct at his office or through the Istanbul Y. M. C. A., of whose board he is a valued member.

GEORGE D. HUBBARD

VEGETATIVE PROPAGATION IN THE MISSOURI GOURD

SOME time ago I noticed that young plants were common around the old plants of the Missouri gourd, *Cucurbita foetidissima,* though no fruits could be found. This made me suspect that they had some vegetative method of propagation. Two methods seemed probable; by formation of buds on the roots, or by forming roots at the nodes which might survive and form new plants.

No nodal roots could be found at the time, but later in the season such roots appeared towards the ends of the numerous vines. The first root on a vine was often 10 to 12 feet from the parent root. Usually but a single root formed at a node, but sometimes two or even three were found. Several of the nodes towards the tip of the vines would form roots.

These roots soon thicken, forming successive rings of bundles somewhat as in the beet. These bundles are small, parenchyma cells filled with starch making up the bulk of the root. By fall they were about a half inch in diameter and looked something like a parsnip. Contraction of the roots tends to draw the vine into the ground at the point of attachment.

I have marked a number to see if they survive the winter, though I have no doubt that they do, as larger roots not attached to the large vines with small vines of their own are common. These were probably formed the preceding summer but may be older.

In the arid places where this plant usually grows such a method of propagation would be a great advantage, as seedlings would only be able to become established in favorable seasons. Even this method might fail in dry years.

So far I have found no mention of this method of reproduction in the literature and wonder if it has been overlooked.

N. F. PETERSEN

LINCOLN, NEBRASKA

MEIOSIS IN HYPERICUM PUNCTATUM LAM.

THE cytology of the *Hypericum* species of New England and vicinity is being studied and will be reported later. It seems well, however, at this juncture to make a brief summary of meiosis in *Hypericum punctatum* Lam. The chromosome behavior in the development of pollen resembles very closely the condition reported by Cleland[1] and others for certain species of *Oenothera.* The development up to diakinesis is very similar. At no time does there appear an extended approximation of threads. Like *Oenothera* the spireme appears univalent and as Cleland remarks seems to call "for a telosynaptic interpretation." After the second contraction there emerges a chain, or chains, of chromosomes fastened end for end like sausages. There are sixteen in all. So far no complete rings or paired chromosomes have been observed as noted in *Oenothera.* Otherwise it might be mistaken for a species of the latter. During the first division the chromosomes show the same tendency to have the alternating ones pass to opposite poles.

[1] R. E. Cleland, "Meiosis in the Pollen Mother Cells of *Oenothera biennis* and *Oenothera biennis sulfurea,*" *Genetics,* 11: 127–162, 1926.