line of the initial letter, thus: P4. In that way it has the same form and meaning as a date written, Jan. 4. The several members of the premolar series may be designated as P1, P2, P3, P4. The same is true of other teeth in other series.

Now, having disposed of the dash, it becomes necessary to distinguish between the upper and lower teeth. Let us employ the printer's distinction of upper and lower case. For upper premolars we will use the capital letter as an index to the series, thus: P4, for lower premolars we will use the small letter, thus: p4. This will be found distinctive and the difficulty of typing and type-setting at once disappear. The plan has in its favor the two-fold arguments of distinctness and of economy.

E. S. RIGGS

FIELD MUSEUM, CHICAGO

TERMINAL ZIGZAGS IN SNOWSLIDE STRIATIONS

IN his interesting article on "Snowslide Erosion,"[1] Mr. Dyson invites discussion of the mechanics of the formation of zigzags in the terminal portions of the striae cut by boulders carried in snowslides. It seems probable that this erratic motion of the boulders is brought about by a similar movement of the snow by which they are transported. It has occurred to the writer that the behavior of the snow in this manner may be analogous to that of a viscous liquid upon being poured in a small stream from a moderate height.

As a rather homely example, let us consider the manner in which our breakfast syrup (if we like it thick) behaves when its fall is arrested by the horizontal surface of the pancake. The falling column of syrup does not simply impinge vertically and expand in all directions from the point of contact. Rather, it swings to and fro at the end, laying down an intricate pattern of undulant loops which merge one into another and then spread out over the surface. These loops may sometimes fall with their long axes parallel, but more commonly so that each loop crosses its predecessor at an angle, in which case the end of the falling stream soon assumes a circular motion; seeming to descend in a widening spiral which merges into the surface of the expanding pool of liquid.

The reason for this lateral oscillation in the lower part of a falling stream of thick liquid seems fairly obvious. Briefly, the end of the stream must receive a slight deflection toward one side or another at the moment of contact due to slight irregularities in the surface against which it strikes, so that the stream is bent away from the vertical. If the fluid is sufficiently cohesive internally, this deflection will tend to increase until it reaches a certain amplitude, whereupon it reverses itself. This reversal is due to the fact that the vertically descending portion of the stream surpasses in velocity that which is falling at an angle to the perpendicular and begins to crowd against it so that it is itself deflected from the vertical and in the opposite direction. This new deflection continues to grow until the critical amplitude is again reached, whereupon another reversal occurs. Since the same conditions which give rise to this terminal oscillation also obtain, though to a lessening extent, in the adjacent part of the stream a series of oscillations of diminishing amplitude appears in this region.

Let us imagine this falling stream of syrup confined between two parallel sheets of friction-free glass, sufficiently far apart to permit the stream to fall freely except that its axis must remain oriented in the same plane throughout. Since we are postulating frictionless glass we can probably tip the ensemble to an angle equal to that of the snow slope without upsetting the conditions that cause the oscillatory motion. If the stream were now suddenly to congeal, the figure presented would be not unlike the path of one of the stria-forming boulders. The path of an individual particle in the center of the falling stream of syrup would closely resemble the striae described. Perhaps we may consider the snowslide as a viscous stream confined between the planes imposed upon it by the solid bed and by the gravitational force acting upon it. To the writer it does not seem too fanciful to believe that the moving column of snow may behave in a manner similar to that of the syrup when the forward part of the column is brought to a sudden stop by meeting some obstacle head-on, which obstacle may consist of large rocks, a sharp change in the angle of the slope or simply more snow in a state of rest.

If the analogy here presented be valid, then the zigzags in the snowslide striae should show a greater amplitude near the lower end than at their inception. It should be of interest to inquire of Mr. Dyson whether or not such an increase of amplitude was noted in the final portion of the zigzags at the time of his observations in Glacier Park.

J. ROBERT WELLS

LA OROYA, PERU

[1] J. L. Dyson, SCIENCE, 87: 365–366, 1938.

A WINTER WHIRLWIND

WHILE driving toward Red Wing, Minn., on the afternoon of November 23, I noticed an old-fashioned whirlwind pass across the road. A slight snow was falling, with the sun visible at some instants. The temperature was 20 degrees above zero and the wind about 8 miles per hour from the northwest. The whirlwind appeared to be the kind I used to see down on the farm in the Ozarks on a warm summer day, except that it was picking up a lot of snow and moving along with the wind. Due to traffic conditions I could not observe any distance up into the air. The whirl