comparatively rare. Now, as we have to deal with rocks having three well-marked varieties of texture, we ought to have a corresponding number of terms for their designation; and I do not see why rocks which exhibit such varieties should not be described as slates, schists, and foliated schists.

However this may be, the term schist certainly ought not to imply or include foliation (or arrangement of two or more minerals in separate layers), as there is no necessary connexion between the two ideas. No doubt a foliated rock will nearly always be a *schist*, as it will *split* readily, but there are plenty of schistose rocks which are not foliated.

Now the texture of the Brazil Wood rock is precisely of this character, and as two micas are its chief constituents, I ventured to call it a micaceous schist; but not mica-schist, and only provisionally, for, as stated in my paper, I regard it as one of a group of rocks which have not yet received distinctive names; they are rocks of great interest, and I hope to have something more to say about them on a future occasion. It appears to me, therefore, that a new name which is fairly descriptive of the rock must be preferable to an old one which is altogether inappropriate. S. Allport.

Birmingham, *January 12th*, 1880.

MR. H. B. WOODWARD'S ADDRESS TO THE NORWICH GEOL. SOC.

Sir,—The legend to the woodcut given on p. 75 of the February Number of the Geol. Mag. having been accidentally omitted, the following explanatory statement is necessary:—

The lowest bed touched in the Subwealden Boring is the Oxford Clay, the succeeding beds (above the dotted line) traced northwards are Corallian, Kimmeridge Clay, Portland Beds, Purbeck Beds, Hastings Beds, Weald Clay, Lower Greensand, Gault and Upper Greensand (together), Chalk. The last two divisions continue as far as the boring at Wells. The uppermost beds at London and Harwich are the Eocene; those at Diss and further north are chiefly glacial deposits. The lowest bed passed through in the boring at Wells is the Lower Greensand, beneath which the Kimmeridge Clay (?) is just reached. Below the dotted line (on the section) three divisions of Palæozoic rocks are shown—the uppermost, distinguished by thick black lines, represents the Carboniferous rocks; the middle "dotted" division represents Devonian rocks and Old Red Sandstone; and the lower "jointed" division represents the Silurian rocks.

The Vertical Scale was 2000 feet to one inch.

H. B. Woodward.

ECCENTRICITY AND GLACIAL EPOCHS.

Sir,—In Mr. Hill's paper on "Eccentricity and Glacial Epochs," the following paragraph occurs in reference to Dr. Croll's contention that the accumulation of masses of snow and ice during the winter would tend to lower the summer temperature: "The First alleged reason," Mr. Hill says, "is the cold produced by masses of ice and snow. If this means that the snow will not be melted easily, because it cools the air, there is self-contradiction. Snow can only cool the air by abstracting heat from it, and if snow takes up the heat, the heat is spent in melting it. As for what is said about cold rendering air diathermatous, so much the better for the melting. If the sun's rays can readily pass through the air, they will the more readily reach the snow which they have to melt. These paragraphs are not worthy of the book."

Has not Mr. Hill misapprehended Dr. Croll's argument?

It appears to me to be of this kind. Regarding climate as the average condition of the atmosphere in respect to heat, and considering the atmosphere as in the main warmed, not directly by the radiant heat of the sun, but by contact with the warmed surface of the earth, then if under any arrangement of circumstances a portion of the earth's surface can remain permanently at a low temperature, the air in contact with that portion of surface (*i.e.* the climate of the region) will also be permanently cold.

Now since the heat that goes to melt snow and ice disappears as sensible heat and produces no rise in temperature, we have a case in point—a permanently cold surface—in regions covered with snow and ice as long as any of the frozen water remains unmelted. The presence of accumulated masses of snow and ice in any region would therefore result in a far *colder climate* than might be expected, taking into consideration only the amount of heat received from the sun. For as long as the temperature of the air is 32° F. or lower, whatever aqueous vapour falls will fall as snow, not as rain; therefore, while snow and ice remain, accumulation will probably not cease, even during the summer. Moreover, although the aqueous vapour coming from warmer regions, on condensing and crystallizing into snow, gives out heat, will that heat avail to raise the general temperature of the air above freezing-point? Will not much of it be lost into stellar space?

To sum the matter up, it is clear that if by some natural process the heat received in polar regions could be transmuted into some other form of energy, while that received in equatorial regions produced the ordinary heating effects, very different climatic conditions would prevail, even if it were possible that the actual amount of heat received in the two regions were the same. In snow-covered countries the bulk of the sun's heat received goes in the work of melting snow and ice, and produces therefore no effect in ameliorating the climate.

R. D. Roberts.

Jan. 21st, 1880.

We regret to record the death of Professor Baron von Seebach, Director of the Geological Museum, Göttingen. He was not only eminent as a man of science, but endeared by ties of warm friendship to a large circle of friends, who will deeply deplore his loss.

Erratum.—In Mr. Clement Reid's paper, "The Glacial Deposits of Cromer," Geol. Mag. Feb. 1880, at p. 56, the bracket for 'Lower Glacial' should not include the 'Forest Bed.'