V.—Rain and Rivers; or, Hutton and Playfair against Lyell and all Comers. By Colonel Greenwood. *Second Edition.* London: Longmans, 1866.

WE scarcely know what to say of this extraordinary book. That it contains many happy theoretical hits cannot be denied, and though the author's propensity for humourous digressions continually disturbs the grave attention of the reader, some portions are well reasoned and clearly expressed. One of his great objects seems to be to attack Sir Charles Lyell, Professor Sedgwick, and other great founders of the science of geology; and while he accuses Humboldt of concealing the laws of Nature "behind the double veil of Greek and Latin," he scarcely writes a page without introducing a Latin sentence or quotation. Still he must be credited with the merit of having been the first, of late years, to give to the world (in the "Tree-Lifter," in 1853, and "Rain and Rivers," 1857,) a clear exposition of the subaërial theory of denudation. Professor Jukes acknowledges this in his "School Manual of Geology;" and it would only be an act of justice if other subaërialists were to make more frequent reference to the author. It would likewise be well if they rendered their speculations more consistent by imitating Colonel Greenwood in laying the main stress on rain and not on rivers, for it is obvious that if rains cannot act effectively in a state of general dispersion so as to produce the gently-sloping declivities which characterize the majority of hills and valleys, torrents and rivers which (as the Colonel admits) act on lines only, could not have given rise to the general form of the ground. As many who have not read "Rain and Rivers" may like to know how far its author has forestalled the more recent advocates of *pluvialism*, we shall give a number of quotations from his work:—

"No marine current could make a single channel *sloping from* a height to the sea; still less the myriads on myriads of dry upper valleys which ramify in all directions, from all river valleys, through and to all sides of the tops of all elevations, whether high or low." "Soil is rotted subsoil," and "is in constant formation over the entire surface of the earth..... Rain produces a denudation of an enormous breadth of hill-*side*..... Rain may be said to form *hills* as well as valleys..... Valleys exist only in the dissolution of hills..... A stream running through ridges, large or small, is the simple consequence of the differing hardness of the ground through which it runs. In all cases a stream cuts for itself a narrow channel, the depth of which is determined by its hardest part..... But the wash of rain digs down where the ground is soft and leaves hills or ridges where it is hard. And as a stream cuts through a hard stratum, say the North or South Downs, the wash of rain is scooping out two lateral valleys *behind* it, that is a valley behind each side of the gorge and ridge, as in the Weald clay. ..... The *débris* of these valleys is carried off by the lowering bed of the river. A ridge is then developed, and the river runs through a gorge in the ridge..... Directly as the softness, is the width.

Above each hard gorge will invariably be a comparatively wide horizontal valley. . . . . Rivers have the power to cut narrow channels or *ravines*, but they have very little power of widening these. Disintegration and the wash of rain widen these ravines into broad valleys. While this is going on, rivers convey to the sea what rain brings to them, ... rain is constantly shoving the whole surface of the earth down towards the sea. . . . . No drop of rain *runs* an inch on the surface of the earth without, as far as it goes, setting some soil forward on its road to the sea, and it wont run back again. No return tickets are given. It will wait there, and go on by the nex-t-rain. . . . . Neither wind nor water, under any circumstances, ever travels empty-handed. . . . . In comparison to the broad waste from the wash of rain, the waste by the *direct* action of rivers may be reckoned as nothing, ... rivers are mere labourers or accessories in the affair. . . . . This universal portage of soil by rain . . . . may also be seen, *oculus fidelibus*, whenever a fence runs horizontally along the side of a hill. A *natural terrace* is then formed, ... the good soil which was on its way to the valley is arrested. . . . . In France I have seen deep terraces result from very narrow strips left uncultivated to decide fields or properties."[1] In chapter xiv. the author advocates the theory that man may have existed during the Silurian period, and asserts that "myriads of species of megatheriums, dinotheriums, anoplotheriums, or *anyothertheriums* (*sic*), may have existed *before* the Silurian or primary and metamorphic period, without a vestige of their fossil remains being found in these strata." (!) One of the best chapters in the book is on "The Travelling of Sea-beach."

VI.—OUR SCIENTIFIC JOURNALS.

1. The Quarterly Journal of the Geological Society of London for August, 1867, No. 91, opens with Mr. Ralph Tate's paper "On some Secondary Fossils from South Africa," a region whose geology and palæontology has several times before occupied the pages of both the Transactions and the Journal of this Society.

The fossils described are fourteen species of plants, thirty-nine mollusca, two corals, three serpulæ, and one cidaris; illustrated by two double and three single octavo plates. The remains are, unfortunately, very fragmentary; so much so, indeed, in some instances as to render their accurate determination a matter open to grave doubt. *Cidaris pustulifera* (Plate viii., fig. 9); *Trigonia Goldfussi* (Plate vii., fig. 6), and *Hamites Africanus* (Plate vii., fig. 5,[2]) are instances of species founded on very slender evidence. Nevertheless, South African geologists may thank Mr. Tate for the work he has accomplished, and we hope they will try to send better specimens home next time for description.

[1] See a defence of this theory by G. Poulett Scrope, Esq., in Geological Magazine for July, 1866.

[2] In the Explanation to Plate vii. p. 174, the names of figs. 4 and 5 are transposed, and in that of Plate viii. fig. 9 it is omitted altogether.