similar problems were familiar to English architects of the seventeenth century.

1666, Aug. 27, I went to St. Paule's church, where with Dr. Wren, Mr. Prat, Mr. May, Mr. Thos. Chichley, Mr. Slingsby, the Bishop of London, the Deane of St. Paule's and several expert workmen, we went about to survey the general decays of that ancient and venerable church, and to set downe in writing the particulars of what was fit to be don, with the charge thereof, giving our opinion from article to article. Finding the maine building to recede outwards, it was the opinion of Mr. Chichley and Mr. Prat that it had been so built *ab origine* for an effect in perspective, in regard of the height; but I was, with Dr. Wren, quite of another judgment, and so we entered it; we plumb'd the uprights in severall places. . . . (From Evelyn's Diary.)

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WEST POINT, N. Y.,
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THE QUESTION OF THE OLDER AND NEWER APPALACHIANS

IN a lucid and valuable article on the geography of the United States, Professor Wm. M. Davis divides the Appalachians[1] into an older eastern and a newer western belt. He makes in New England the Taconics and the great limestone valley the newer, and all the rest of New England from and including the Green Mountain range the older. By this he means composed mainly of older rocks.

The distinction is good, but the names should be reversed for New England.

The western division contains mainly Cambrian and Ordovician rocks. A narrow interrupted band of Archæan forms the west border of the eastern band, going south from the Hoosac Tunnel. Next east is a band of the Hoosac and Rowe schists, which are correlated with the Berkshire schist of the western division and so are Ordovician. Next east is the much broader band of the "Calciferous Mica Schist" (the Goshen and Conway schists), which extends to the Connecticut Valley, and widens northerly into Canada, carrying Silurian fossils. Next east is the Bernardston Devonian, underlying the Connecticut Valley and in part covered by Trias. The whole of Worcester County is Carboniferous, cut by late Carboniferous granites. The new discovery of Carboniferous fossils in Worcester by David White reinforces Perry's earlier finds, and all the Carboniferous rock types occur in the eastern rim of the Connecticut Valley, and all the intervening country can be connected by transitions with the undoubted Carboniferous.

East of Worcester is a narrow seaward band of Algonkian and Cambrian greatly covered by Carboniferous, so that about nine tenths of the area between the Housatonic Valley and the sea is covered by rocks newer than those of this valley and the Taconics.

This change of name does not lessen the great value of the distinction, which is based not so much on age as on the presence of the great limestone in the western belt and its lesser metamorphism, which has caused great differences in the topography. The lesser metamorphism of the western belt depends, in part, on the absence of granite which has overwhelmed all the area of the eastern belt. They have both been subjected to the same folding and uplifting agencies, but the overthrust faulting along the east border of the limestone valley has had for an effect that less and more varied pressure was transmitted westwardly, while the greater pressure in the east has not only caused greater metamorphism across central New England, but the extensive intrusion of various granites has greatly increased this metamorphism, and has left a country where a very broad meshed network of Carboniferous schists rests in great areas of carboniferous granite.

The eastern division, which has for its western border the Green and Hoosic Mountains, constitutes the New England Province, and, taken as a whole, has an interesting balanced arrangement. The ancient Green Mountain protaxis made up of Archæan to Ordovician rocks is balanced on the east by the equally ancient Nova Scotian series, which is lithologically similar, and both are gold bearing.

Next inwardly the narrow fault bounded

[1] Mill's "International Geography," pp. 717–732.

Connecticut Valley depression with its Triassic traps and sandstones stands over against the similar narrow Triassic basin of the Bay of Fundy, continued in the Boston and Narragansett basins. There remains the broad central New England Plateau, made up of great late-Carboniferous granite batholites running north and south, or with a little easting and isolated by bands, often very narrow, of late Paleozoic rocks, largely Carboniferous.

The series of batholites in this central plateau is itself symmetrically arranged and becomes more basic from the center outwardly.

Crossing the center of the plateau from north to south is the broad Hubbardston-Princeton band of granite which is truncated by erosion so nearly along its contact with the cover of Carboniferous schists, that it is everywhere contaminated with the sillimanite and graphite of these schists, and is made coarsely pegmatitic from the water obtained from them.

Next on the east is the long train of oval batholites running through Worcester, the Ayre series, which are of uniform porphyritic texture, and are matched on the west by the coarsely porphyritic Coy's Hill series, passing east of Ware.

Next outwardly the dark biotite Bolton granite-gneiss on the east is matched by the broad band of the black Hardwick biotite granite, passing through Ware.

Then follows on the east the fine-grained Milford biotite granite, so valuable as a building stone, which is comparable with the Monson and Pelham biotite granites on the west, which are also extensively quarried.

Finally, the complex Quincey-Dedham series of igneous rocks along the eastern border of the area, with its basic and soda-rich rocks, is balanced by the basic Belchertown series, which is a counterpart of the Cortlandt series, and borders the plateau on the west. Each marks the locus of a principal fault system which form, respectively, the eastern and western limit of the plateau. By contrast faulting is wanting or inconspicuous in all the central portion of the province.

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SCIENTIFIC BOOKS

Oxidations and Reductions in the Animal Body. By H. D. DAKIN, D.Sc., F.I.C., The Herter Laboratory, New York. Longmans, Green & Co., New York. 1912. Pp. viii + 135. Price $1.40 net.

For some time in the past, "energy" has been the keyword of the theories of nutrition. The problems presented in relation to the transformation of energy in the body were so conspicuous and the technique of investigation so effectively improved in application to the study of the metabolism of energy, that other aspects of the subject were neglected. This trend of the science is reflected in the popular literature of the present time when expressions like "calories" and "fuel value" are employed with the skill of the conjurer to impress the uninitiated. The mere comparison of the intake and the output of the organism and the broad statement that metabolism is essentially a process of oxidation change has, however, long since failed to satisfy the more critical inquirer; and accordingly the questions of what is now termed intermediary metabolism, concerned with the destiny of the individual nutrients or corresponding tissue components, are forging to the front. The newer knowledge of the chemistry of the digestive processes has made great strides in a decade or two. Yet how little we know of the various steps beyond the barrier of the intestinal wall.

It is of certain of these intricate processes considered primarily as chemical reactions that the present monograph aims to give an account. The animus of the attempt at what is essentially a novelty in the literature of physiology may be elicited from a few quotations. Dakin writes:

> The statements that fats and sugars are oxidized in the body to carbon dioxide and water, while proteins yield urea in addition, are no longer considered all-sufficient explanations of the chemical rôle of these substances in the animal economy. The study of chemical structure is rapidly changing the whole aspect of biological science, and we may confidently look forward to the time when the orderly succession of chemical reactions consti-