

coveries clash with the faith, according to the thirty-nine articles? What guarantee have we that he will be content to do so? In withholding the Scriptures from the people, and shutting off philosophy entirely from the things that belong to faith, the Church of Rome occupies a strong and almost impregnable position; for if there be no reading there will be no inquiry, and if there be no inquiry, there will be no doubt, and if there be no doubt there will be no disbelief. But the union of philosophical inquiry and religious faith is not a natural union of kinds; and it is difficult to see how the product of it can be much different from the hybrid products of other unnatural unions of different kinds. H. M.

Force and Nature. Attraction and Repulsion. The radical principles of energy discussed in relation to physical and morphological developments. By CHARLES FREDERICK WINSLOW. Macmillan and Co., 1869.

DR. WINSLOW appears to be an American physician, who has travelled over a great part of the earth, and has given much zeal and energy to wide-reaching and somewhat vague speculations concerning the forces of nature. It is a little amusing to observe with what entire good faith the author, whose enthusiasm is constantly carrying him into hypothetical conjectures and assumptions, believes himself to be proceeding carefully and safely on the firm ground of observation. The real truth is, that he has a theory which he believes to be capable, when rightly applied, of unlocking many scientific secrets, and he has laid hold of facts, often opinions of facts, from all quarters of nature, and compelled them to submit to his principle and to range themselves in apparent support of it. In fact, he seems less disposed to solicit nature than to ravish her. The central idea of his book is that there is a force of repulsion, as well as a force of attraction, pervading nature universally, and he is amazed at the way in which this force has been hitherto overlooked. But has it been overlooked? If our memory serves us correctly, there was a book called the *Philosophy of Nature*, published by Dr. Boase expressly to prove the existence of such a force of repulsion. He maintained a real dualism of powers—attraction and repulsion, in all natural bodies, and repudiated the identity of force. Some years have passed now since we, without imagining that we were reading anything new, read as follows:—

“Though it may seem difficult to avoid the conclusion that there is fundamentally but one force which manifests itself under different modes, yet such a supposition at present transcends the domain of science. As a matter of fact, we are compelled, in order to form a satisfactory conception of matter and its forces, to regard it under a two-fold aspect. In all our conceptions we imply a sort of dualism of power in every body. The hinges of gravitation, for example, keep worlds in their orbits by opposing a centrifugal force, which would otherwise drive them afloat into space. The smaller hinges of molecular cohesion retain the infinitely smaller bodies which we call molecules of matter, in opposition to a repulsive force which, on the application of a little heat, may drive them off into space, and in volatile substances does so drive them off without heat. There is a relation of molecules to one another which we are compelled to represent in conception as the result of a force of repulsion or tension. . . . Attraction plus repulsion of molecules constitutes our conception of matter; and in observation of its modes of energy, attraction is recognised in gravitation, cohesion, magnetism, while repulsion is found in the centrifugal force, in heat, and in electricity.”

If, therefore, Dr. Winslow's speculations regarding repulsion and its modes of manifestation are not better founded than they are novel, they will hardly effect such a revolution in thought as he seems to expect them to do. The reader cannot fail to be struck with the immense amount of repetition in the book; over and over again we have the one idea of a repulsive force affirmed in nearly the same terms, and these not always put in the best style or with the best taste. Take, for example, a sentence like this, which is certainly built up what in America would be described as rather tall language:—“But when the mind rises to grand generalisations, and comprehends that the entire series of phenomenal events transpiring in the physical universe rests upon the simplest plan; that all spring from the action of one overruling law; that all flow from one incomprehensible central Being, whose ways are eternal and immutable—whose grasping, quivering arms, for ever stretching out and drawing back by turns, are nerved by the same invisible and immortal elements as our own, but which, shooting from the very central atom of the cosmos,

strengthen as they glide and tremble from star to star, spreading asunder and binding together atoms and worlds alike; that the wonderful agents of this universal power are the simple molecular activities of repulsion and attraction, developing from zero into infinite quantities, and assuming isolated cosmic conditions with mutual affinities and antagonisms;—when the mind embraces their simplicity unfolded into its infinite and amazing grandeur, philosophy will have discovered the natural path for a fertile, harmonious and happy solution of past and present celestial problems.”

It is certainly a singular picture, which the author presents us, of the grasping, quivering arms of the one incomprehensible Being, stretching out and drawing back by turns, nerved by the same immortal elements as our own, and gliding and trembling from star to star. The idea which is almost irresistibly suggested is that of a big polype. But the question of the value of Dr. Winslow's book is not a question of execution, but of the worth of the speculations which he broaches. It can hardly fail to do good to call attention, as he has done forcibly, to the probable existence in nature of a force of repulsion co-extensive with a force of attraction, and to indicate the proofs of its action in the different phenomena of the various regions of nature.

The second part of the book contains numerous tables compiled from the study of seismic phenomena, and facts of the author's observation, in order specially to prove the existence and action of a force, “the dynamical relations of which are developed and intensified both in comets and in our own globe, in virtue of the reign of a cosmic law of *action and reaction proportionate to distances inverse*; that is to say, of a force which develops intensities of internal mechanical effects that increase and decrease directly as these bodies approach and recede from the sun.”

The third and concluding part is occupied with “the solution of cosmical problems which have heretofore defied the penetration of speculative mathematics.” We know not how it may be with others, but we find the proffered solutions to defy our penetration. It is a strange mixture of metaphysical speculation with physical theories, worked out, however, in strict accordance with the author's conviction that a true and enduring system of positive philosophy must embrace both physics and metaphysics. To us much of his speculation appears to be vague, barren and fanciful.