we have extracts from five of Neri's books: from the book *segniato A*, 155 pages; from *B*, 78 pages; from *D*, 5 pages; from *E*, 13 pages; and from *F*, 6 pages. Between *E* and *F* are inserted 26 pages of "Operationi Copiate da un libro antico qui in Pisa;" also 8 pages about the *Green Lion*, and 10 pages of extremely mystical and unintelligible matter, replete with symbols and Arabic words concerning a certain *Donum Dei*.

An account of the subject-matter of the extracts from the book designated *A* will, I think, give a fair idea of that of the whole MS. In the first place, we have an account of mercury, to which metal is assigned no less than thirty-five different names, and twenty-two symbols. The Eastern element, then very apparent in chemistry, is noticeable in such names as Chaibach, Azoch, and Baruchet. Various *fixationi* of mercury are described, and the formation of some of its compounds. Gold and silver are next discussed; the latter has fifteen names and ten symbols. The fixation and calcination of gold, the calcination of silver, the solution and tincture of silver, and the conversion of silver into gold are then described. Venus (copper) follows, among the fifteen names of which are Tubalchaim, Marchaal, and Cohon, but not Cuprum, or Orichalcum, or *Æs Cyprium*, which is surprising. Then come iron, lead, and tin; then vitriol, which has seven symbols; sal-ammoniac, which has fourteen symbols; sulphur, which has sixteen; arsenic, antimony, sal-alembrot, sal-tartaro, sal-anticar, and cinnabar. The extracts from book *A* are concluded by accounts of the calcination of various metals, of the philosopher's stone, and of the work of transmutation. The short extracts from the other books contain matter of a similar nature; various well-known salts are described, together with new and varied modes of making them; and different solutions of the metals, compounds, and operations.

The ideas suggested by this MS. are manifold. We can but be struck by the excessive complexity of chemistry at this period. When a substance possesses more than thirty distinct names, and more than twenty symbols, and when these are used indiscriminately in one sentence, some idea may be formed of a chemical treatise of two centuries and a half ago. Symbols were used lavishly, not alone to express substances both simple and compound, but for operations and instruments. But the alchemists and old chemists had a special object in preserving the mysticism out of which their science had sprung, and which still, as a thick vapour, shrouded it in obscurity. Their precious *secrets* would otherwise have been at the command of the vulgar, and the result of their years of toil would have been sown broadcast over the world. The true science was but just beginning to loom through the darksome mists which surrounded it. At this time the science was made up of alchemy and iatro-chemistry, with a strong flavour of Kabbalism. As to the matter itself, we find in the works of the period scarcely anything more than had been enunciated by Geber some eight centuries earlier; in fact, there was too much beating about the bush to allow of any real progress. Antonio Neri was a somewhat sensible chemist for the period. His leanings towards alchemy were not excessive; he was not a violent Paracelsian; indeed, he was rather a metallurgical chemist than an iatro-chemist.

Such is a brief sketch of an MS., the matter of which, in a completer form, the priest Antonio Neri had intended to publish had his life been longer spared. Whether the original MS. exists we know not. Perchance it may be hidden in some old monastic library among volumes of Canon Law and countless folios of Middle Age Casuistry; perchance in some dusty nook in *Ædibus Vaticanis*, among the thunderbolts of a past Hierarchy. Who can tell? Oh! if some Sovereign Pontiff would issue a mandate *apud S. Petrum sub annulo Piscatoris*, to command the cataloguing of the library of the Vatican, how would not Literature, and Science, and Art be benefited by the means! and how would not Italy receive yet greater honour as the focus from which emanated the glorious light of Western civilization!

GEORGE FARRER RODWELL

CATLIN'S AMERICAN GEOLOGY

The Lifted and Subsided Rocks of America, with their Influences on the Oceanic, Atmospheric, and Land Currents, and the Distribution of Races. By George Catlin. (London: Triibner, 1870.)

IN this free-speaking record of what Mr. Catlin has seen of American geology, and of his interpretation thereof, we have the results of strong observational powers and of limited scientific knowledge, stated earnestly and ruggedly, with a faithful adherence to what was first mastered in books, and to the views of nature that early teaching gave. Such works are not rare, but they are not often noticed at large, unless, as in this instance, the author's individuality, sincerity, and earnestness are true and striking. We find in this book on the "Rocks of America" that the author believes, first, in the hypothetical granite of a primæval world; secondly, in a "schistose zone, quite around the globe, and undoubtedly more or less an open and defined fissure between the two systems" of granite below and "sedimentary formations" above (p. 81); thirdly, "that these vast sedimentary beds, underlying secondary rocks on almost every portion of the globe, have been laid by the agency of water, with the disintegrated particles of granite, and by some (as yet mysterious) process become solidified and crystallised much in the same form, and certainly with the same ingredients, as the granite from which they came" (p. 80). It appears, also, that these low-seated sediments comprise the "azoic and palæozoic rocks" of books; "that the remains of rhizopod and algæ life [*sic*] may be found below gneiss" (p. 140), but not in the limestone in the gneiss; that the acceptance of the Laurentian system of rocks, as worked out and explained by the Geological Surveyors of Canada, is to be deprecated; that the Laurentian limestones have been deposited in "the caverns formed underneath submarine mountains, which are free from all currents of the ocean, by the infiltration of water from the overlying calcareous rocks;" "that in these caverns the first movements of organic life (which could not have existed exposed to the currents of the ocean) began;" and that these limestones were thus "imbedded, and in horizontal strata, beneath azoic rocks, and containing the '*Eozone Canadensis*' [*sic*], and other rhizopod remains which have excited so much attention of late, and been ingeniously used to undermine the

established system of geological formations" (p. 141). Fourthly, "that the granite crust, though cracked at various points, from contraction on cooling, has a limit to which those rents descend, below which, from intense heat, and the hasty and unindurated state that the external border of the molten mass must be in, the contraction has not taken place; and being in an arched shape, and resting on a liquid far more buoyant than water, that no fracture of the crust to the surface of the igneous mass has ever taken place, and that no amount of matter could be concentrated on the surface of the earth to produce that effect" (p. 82). Fifthly, that what any geologist would recognise as the *débris* of broken granite decomposed in place, Mr. Catlin refers to eruption from his subterranean granite crust, thus:—"In the Rocky Mountains and the Andes granite is very rarely seen, and when met (at the mountain's base, as it most often is, or on its summit), it is uniformly seen in amorphous masses of various sizes, with shapes plainly telling its history, that it has been shattered and torn from its bed by subterranean explosions or other disturbance, and lifted by (or has followed) the rising mass to the summits of the highest mountains, and flowing out from these, is found at the mountain's base, where it has rolled, while the mountain's top is gneiss" (p. 86). Sixthly, that water, getting to the molten mass below the author's granite, has expanded, and not only erupted the granitic boulders, but blown out great cavities, into which vast areas of surface (as the Mexican Gulf and Caribbean Sea) have fallen, making catastrophes, and leaving "subsided rocks"; whilst elsewhere the cavern-roofs have been held up as "lifted rocks." Seventhly. That the mountain floods rush into and along these cavities, leaving but little to reach the plains (p. 11); that such "submontagne currents" as these, "heated by the volcanic furnaces they have passed" (p. 4), rush out into the Caribbean Sea, and make the Gulf Stream. Eighthly. The Caribbean subsidence deluged the whole Antilles and many Aztec cities, dispersed some of the aborigines among the heights of Mexico and the Rocky Mountains, and sent some Caribs to Guiana, Venezuela, and Honduras, whilst others were transported to Florida, Newfoundland, and Scandinavia, in frail craft on the broad back of the new-made Gulf Stream, that still favours us with such of nature's blessings as it has to give.

Though not always urging his own suppositions without some doubt, Mr. Catlin is dogmatic enough in condemning the present views of ethnologists and geologists when not coincident with his own, as must be too often the case, judging from the foregoing exposition of the main points of his baseless and inconsistent hypothesis.

"I was born in the midst of the Apalachian Ranges, and amongst them spent my hunting and fishing days; and neither there nor in twice crossing both the Rocky Mountains and Andes chains, have I seen anything but the sedimentary and volcanic rocks, excepting here and there beds of shoved-up boulders of granite, raised in the manner already described." Thus the author writes at p. 92; and the mountain-life in youth and hard travelling in middle age, here indicated, are as plainly shown forth in the curious book before us, as a very imperfect geological knowledge is shown by the latter part of the sentence and its explanations as found at other pages.

Mr. Catlin's love of wild scenery, his recognition of the wonderful and mysterious in nature, his limited range in modern geology, his adherence to some old theories, his disapproval of later geological discoveries, and his assumption of hypothetical notions that have sprung up in his own active, wondering, and impressible mind, clearly witness that, "as a reader of geological works, and a spectator of many stupendous orographic structures" (p. 200), he has been self-taught on a very limited basis of natural science. Nevertheless, he conscientiously believes that he offers something towards the explanation of the geographico-geological structure of America, and of the history of the human millions who have inhabited those broad lands, with strange lives and languages, and have either disappeared for ever or have left degraded remnants, still decreasing under the deadly influences of the European. The world knows how warmly and persistently Mr. Catlin has laboured for the benefit of the Indians; not merely preserving their traditions and scraps of history, their languages, religions, customs, and features, but in damming back, if possible, the evils that befall them from their Christian neighbours. He has, indeed, spent the greater part of a long and toilsome life in helping them directly or indirectly; and the remembrance of their unfailing hospitality and kindness is with him in striking contrast with the treachery and cruelty they have suffered, and with the indifferent treatment he has himself received from his own people in the matter of Indian research, as detailed at pages 190 *et seq.* and in the Appendix.

T. RUPERT JONES

THE MODERN BUDDHIST

The Modern Buddhist: being the views of a Siamese Minister of State on his own and other Religions. Translated, with remarks, by Henry Alabaster, Interpreter of H.B.M. Consulate-General in Siam. (London: Trübner and Co., 1870.)

THIS is an extremely interesting little book. The minister whose views it records—Chao Phya Thipakon—conducted the foreign affairs of his country from 1856 till two years ago, when he was stricken with blindness and was obliged to retire into private life. It was then that he published the work—"a book explaining many things"—the more important parts of which are here translated. We need scarcely say that, looked at from our point of view, some of his beliefs are sufficiently strange, and that he sometimes expresses opinions on subjects which are altogether beyond the range of science. At the same time he has in many respects advanced far beyond the great mass of his co-religionists. He will accept nothing merely because it has been handed down by tradition, but demands proofs which will stand the test of rigid examination. In endeavouring to explain such phenomena as rain, epidemic diseases, the tides, &c., he will have nothing to do with spirits, good or bad; he takes his stand on observed facts, and although his explanations may sometimes be inadequate, they are generally quite in the spirit of modern Western investigation. So far as he understands them, he heartily accepts the European doctrines of astronomy. All this strikes a European reader as very incompatible with certain aspects of the