

of Scripture and eclectic speculation is still harder; and perhaps hardest of all is to assign him his due place historically. To these tasks Dr. Drummond has set himself with true scholarly zeal, and has fought his way through the difficulties with admirable success. The blending of Hellenism and Judaism which prepared the way for Philo is expounded at length, and with much independence. Here Dr. Drummond is on familiar ground, and many of Gfrörer's opinions are contested with reason and force. The doctrine of the Logos is dealt with at great length, and with eminent fairness. The whole work is a credit to English learning, and should stimulate philosophical studies.

MARCUS DODS.

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### BREVIA.

**Second Twilights and Old Testament Miracles.**—A committee of the Royal Society was appointed some time ago to collect all accessible information upon the subject of the volcanic eruptions which took place on the island of Krakatoa in August, 1883. The report of that commission has just been issued, and a most instructive and fascinating volume it is. The various data are illustrated by maps, drawings, and diagrams, and six water-colour sketches of the wonderful skies seen in England shortly after the eruption.

The remarkable glows of colour seen in the late autumn of 1883, long after sunset, will be fresh in the recollection of most students of nature. Within a few days or weeks of the eruptions this phenomenon attracted attention in Australia, Honolulu, China, Japan, and in almost every part of Europe. After sunset, a first flush of colour appeared, lasting fifty minutes, followed after a while by a second, lasting in many instances nearly an hour and a half. The sunset scale of colour was inverted, the glow of singular brilliance and its continuance into the far night almost unexampled. In tropical latitudes, the sky-effect was sometimes mistaken by the sailors for the northern lights.

The evidence brought together tends to show that these highly tinted clouds were formed by extremely minute particles of vitreous pumice-dust held in suspension in the upper region of the atmosphere. For hundreds of miles along the coasts of Java and

Sumatra dust fell, the analysis of which justified this conclusion. It was probably formed by the expansion of gases or steam at the time of the explosion and ground into these microscopic fragments by the eruptive force of the volcano. The particles, it has been calculated, were between one twenty-five-thousandth and one two-hundred-thousandth of an inch in thickness, and the stratum they formed extended from eighty to one hundred and twenty thousand feet above the surface of the sea. As windows burn with the ruddy reflections of the setting sun, these glass-like particles of pumice-dust, held in suspension at a height within reach of the sun's rays after he had passed the horizon, are supposed to have returned his illumination to the darkening earth.

The report contains an interesting list of past eruptions which have been followed by similar spectacles. 1831 was a year of marked volcanic activity. Eruptions are recorded of Etna, Vesuvius, and some of the Central American volcanoes. "The extraordinary dry fog of that year was observed in the four quarters of the world. The sky was never dark at midnight, and even in August small print could be read in Siberia, at Berlin, and Genoa. On August 3rd, at Berlin, the sun must have been nineteen degrees below the horizon when small print was legible at midnight."

On September 2nd, 1845, Hecla was in eruption. "Near London, on September 6th, 1845, at 6 p.m., there was a brilliant orange-coloured sky and brilliant and clear sunset. The sun's disk was silvery white as it touched the horizon. The solar rays were visible at 10 p.m., downwards and upwards."

Eruption of Hecla, 1846. "From the middle of April to the end of May there was an extraordinary after-glow in Switzerland. It lasted one hour thirty minutes on May 21st, one hour twenty minutes May 23rd, one hour twenty-five minutes May 28th, and forty-five minutes May 31st. It had the appearance of a column or pillar of red light, and was at one place attributed to a supposed conflagration."

It is perhaps a far cry from Krakatoa to Beth-horon. If the story of these marvellous phenomena had been found in the Bible, what scepticism we should have shown in accepting it! Had we read in the book of Joshua or the prophecies of Isaiah that a month and a half after Midsummer Day small print was read at midnight in one of the capitals of Europe without the aid of lamp

or candle, the less reverent of the unbelievers would have found in the bare statement a fund of amusement that would have lasted their successive generations of disciples for centuries. And yet, however little science the Bible historians may have had, they have every claim to be regarded as trustworthy witnesses of the facts they record. We speak sometimes as if the capacity for accurate observation had sprung up within the last thirty years. As a matter of fact, through the division of labour in our overcrowded civilizations, the capacity for direct observation tends to decline, if not to quite die out. What *has* grown is the scientific aptitude to explain and classify facts, not the trustworthy eye to note them. The Israelites, fresh from the vigils of the wilderness, their lusty descendants in the times of Hezekiah, were just as competent to observe all the facts that address the eye as are any of us. Our superiority consists rather in finding the right place for our facts in the complex system of nature.

Is it not possible to explain the prolongation of the light on the evening of the battle of Beth-horon, poetically described as "the standing still of the sun," by one of these after-glows to which the attention of the scientific world has been recently directed? May not the stones rained down from heaven upon the kings in their flight have been volcanic ash and pumice? The battlefield was not many miles away from an age-long centre of volcanic disturbance. In the eruption of 1883 ash and pumice-stone were carried incredible distances, and burnt the clothes and skin of those upon whom they fell. Possibly some who choose to regard the after-glows of 1883 as meteoric in their origin may think that the late Dean Stanley has dismissed too lightly the idea that the stones which fell upon the kings in their flight were meteoric. Would not the meteoric, no less than the volcanic, theory explain both the stones from heaven and the protraction of the twilight for the last crowning act of the wonderful battle?

May not the going back of the sun ten degrees on the dial of Ahaz, as the sign of Hezekiah's recovery, be also explained by one of these marvellous second twilights? Some observers of the recent after-glows describe their position as twelve or fifteen degrees above the horizon. Is there not something in this rough coincidence of measurement? It may be said Isaiah gave the king his choice of a sign, for he promised that the shadow should go either backwards or forwards. The objection is perhaps not

formidable, for at the time of the Java eruptions there were fore-glow before sunrise darkening back again for a time into night, as well as after-glow ensuing upon the sunsets. If these records had been found anywhere else than in a sacred book, they would probably have long since been accepted as hints of some genuine optical phenomenon unknown as yet to modern science.

Upon either of these theories the miracles of course remain the same, although the clumsy expedient described as "a suspension of the laws of nature" is no longer necessary for their explanation. I am afraid some Christians revel in the grotesquely miraculous. There is a touch of ostentatious pharisaism in their faith, and to illustrate the superiority of their faith to that of the more rational people, who cannot accept a miracle if it involve what seems an impossible method, they delight to make the miraculous elements of the Bible history as *bizarre* as possible. The more portentous the wonder they can digest, the grander, it is assumed, the spiritual health of which they are the show specimens. Such persons will probably still delight to think of the earth as though it were a racing man's stop-watch, and could be pulled up at a moment without disaster, and after an interval started again. If these sigus over Gibeon and on the sun-dial of Ahaz be explicable by after-glow, difficulties may be removed from the path of many to whom the old conception of the method of the miracles has been a stumbling-block. And yet at the same time the providential character of the narratives is not destroyed. The coincidence of these after-glow with the necessities of Joshua's campaign against the kings and with the recovery of Hezekiah from his sickness, and the prediction of these coincidences by Joshua and Isaiah, will sufficiently vindicate the supernatural providence of these events. The miracles will assume a prophetic rather than a thaumaturgic type. The Bible writers record what was seen, and never commit themselves to theories of the processes by which the wonders they relate were effected. If we hesitate to commit ourselves to this hypothesis of the miracles, the curious information brought together in the report referred to will at least serve to show how much remains to be learned in the domain of natural law, and should warn us against an attitude of contempt towards the miraculous elements in the Old Testament histories.

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