## SCIENCE

### ASTRONOMICAL LITERATURE.

*Is Mars Habitable?* By Alfred Russel Wallace, F.R.S. (Macmillan & Co.)—The veteran naturalist Dr. Wallace appears before the public again with a controversial work, called forth by Mr. Percival Lowell's publications on the planet Mars, in which that persevering observer expresses more and more decidedly the view that the so-called canals on the planet's surface, the number of which has been greatly increased since Prof. Schiaparelli first called attention to them, are really artificial formations, constructed to irrigate large tracts of land in an ever-decreasing supply of water. We noticed Mr. Lowell's last work in our number for April 20th, 1907, and pointed out that there may be other and more probable ways of accounting for these formations, though we cannot withhold our admiration from the industry of the Martians, if this view be the true one. In a paper recently communicated to the *Journal* of the British Astronomical Association, Mr. Lynn suggested that they might be the effect of long cracks in the ice with which the surface of the planet is probably covered.

It must never be forgotten in discussing the condition of this surface, that the atmospheric density, and therefore power of retaining heat, is very much less than on the earth, probably not exceeding that on the tops of the highest mountains. Dr. Wallace refers to this point; but he is also able, from his great geographical knowledge, to show that even on the earth there is a marked tendency in many places to formations running in straight lines—that is, of course, to portions of great circles on a sphere. His book on 'Man's Place in the Universe' appeared in 1903 (reviewed in our columns on November 28th of that year), when the author, though in the eightieth year of his age, was in full possession of those powers in which we are glad still to notice no diminution. It caused a great sensation in astronomical circles, it being felt that the author was not a specialist in that science, and perhaps carried his views respecting the construction of the stellar universe further than was justifiable. Here we would rather pass over that extension of his speculations, and confine ourselves to those relating to our own solar system.

Now if we consider the conditions of the bodies of that system severally, there really seems very little probability of life, at any rate intellectual life, residing in any. That of Mars is the only one in which any person now strongly contends for it. Venus, it is true, has been more mildly suggested; she is much larger than Mars, nearly equal to the earth in size, but her atmosphere would seem to be very dense, as we see virtually nothing of the surface; and if Schiaparelli's view be true that she, like Mercury, rotates upon her axis in the same time as that in which she revolves round the sun, she can scarcely be a suitable abode for life.

But the present discussion is as regards Mars. Dr. Wallace suggests a totally different view with regard to the formations giving the appearance of canals, whilst agreeing that seasonal changes are probable. He rejects the nebular hypothesis or theory of Laplace, and indeed that theory has received many hard knocks of late years, particularly owing to the difficulty of accounting for *rings* of matter thrown off by a rotating nebulous mass coalescing into single bodies or planets. Dr. Wallace gives his adhesion to the meteoritic theory of Sir Norman Lockyer, and by its aid accounts for much in the condition of the planets, and particularly of Mars.

It is when we endeavour to go beyond the bounds of our own system that we feel, in discussing the question of habitability, we are transgressing beyond the ken of even modern science. The fixed stars are known to be suns or self-luminous bodies. It is little more than a century since we recognized the fact (first proved by W. Herschel, though the idea had been indicated even before his time) that many of these bodies are revolving round each other, or rather round their common centre of gravity; but of the nature of any bodies opaque and receiving only reflected light from these—*i.e.*, in similar positions to our earth and the planets—we know nothing, though the mere existence of some large opaque bodies is shown by the effects of their gravitating influence on others which are luminous.

We can only say in conclusion that Dr. Wallace's book is worthy of the most careful study. The publishers have made the task easy by the clearness and accuracy with which the volume has been produced.