MAN'S PLACE IN THE UNIVERSE.*

Dr. Russell Wallace has been in no sense daunted by the hostile reception of his article which appeared simultaneously in the Fortnightly Review and the New York Independent. With the full courage of his opinions, he has now issued this volume, which sets forth as considerable and desirable length the evidence on which he bases his conclusion. Probably his case could not be urged with greater weight or stated with more conspicuous clearness than in its latest form, and certainly the arguments cannot be dismissed with either silence or contempt, though some of the most important links in the chain are still crude assumptions. It will be convenient here to quote in full the paragraph entitled "Conclusions" on p. 317. We shall then be in a position to deal with Dr. Wallace's argument.-

"Having thus brought together the whole of the available evidence bearing upon the questions treated in this volume, I claim that certain definite conclusions have been reached and proved, and that certain other conclusions have enormous probability, which may be so related as to seem to certain persons to be self-contained, destroy Dr. Wallace's case, for universes or classes of universes cannot be asserted, and the advantage might disappear altogether, or alter its character or area of operation. Dr. Wallace's proposition is therefore limited to a certain stellar system, and is one that, if true, may (and perhaps must) become untrue at some future time. There seem to be, however, strong reasons for the belief that this stellar system or universe is finite, that our sun is situated in the central plane of the sidereal universe, and that the stellar system is situated in the plane of the Milky Way, and not far removed from the centre of that plane. The earth is therefore nearly in the centre of the sidereal universe. These latter conclusions depend upon the combination of a large number of special conditions, each of which must be in definite relation to many of the others, and must all have persisted simultaneously during enormous periods of time. The weight to be given to this kind of reasoning depends upon (4) that no other planet in the solar system than our earth is inhabited or habitable; (5) that the probabilities are almost as great against any other sun possessing inhabitable planets; (6) that the nearly central position of our planet in the solar system than our earth: (7) that this universe consista throughout of the same kinds of matter, and is subjected to the same physical and chemical laws. The conclusions which I claim to have shown to have enormous probability are:- (1) that the sidereal universe is finite, that our central position in the great star system, it meant nothing, is to the mathematician at any rate, open to very grave doubt. The law of motion are in no sense self-evident. Nor is there any reason to accept as incontrovertible the assertion: "that the fundamental law of gravitation extends to the whole physical universe is rendered almost certain by the fact that double stars move round their common centre of gravity in elliptical orbits which correspond well with both observation and calculation, and that the law of gravitation is, to the mathematician at any rate, open to very grave doubt. In this very book Dr. Wallace quotes Mr. E. T. Whittaker as writing:-

"I doubt whether the principal phenomena of the sidereal universe are consequences of the law of gravitation at all. I have been constantly led to the conclusion that the law of gravitation is but an approximation to an explanation—but it is electro-dynamical and not gravitational. In fact, it may be questioned whether, for a tremendous extent as the Milky Way or nebula, the effect which we call gravitation is given by Newton's law; just as the ordinary formulae of electrostatic attraction break down when we consider charges moving with very great velocities."
Now it seems scarcely legitimate argument to use this statement in order to escape from the conclusion that the proper motions of the stars cannot be explained by the gravitative forces of the stellar system, and yet to declare that the fundamental law of gravitation almost certainly extends to the whole universe in order to persuade the reader that there can be no astonishing events happening afar off that could render the arguments of this book mere nonsense. Our criticism on this aspect of the case is, in fine, this: Dr. Wallace has assuredly not established his proposition "that this universe consists throughout of the same kinds of matter, and is subjected to the same physical and chemical laws." The probabilities are against the truth of such a generalised proposition, and if it is not true, then with other matter and other laws we may well have a new heaven and a new earth and a new man on the other side of the region of Sirius as wonderful as the heaven and earth and man of this possibly central spot of the galactic circle.

It would seem, then, that Dr. Wallace in his first three conclusions is not invulnerable. His further conclusions, that practically all stars belong to binary or multiple systems which are necessarily planetless, are gigantic and unwarranted generalisations. Moreover, he is in error when he declares that "organised living beings wherever they may exist in this universe must be, fundamentally, and in essential nature, the same also." He admits that this need not be so if matter and its laws undergo a change. The revelations of radium and of electricity make it impossible to disbelieve that there are such changes in the stellar universe. But if the limits of the problem can be restricted in this fashion, there is in reality little problem left. The elaborate and (from other points of view) intensely fascinating description of the creation of the environment that rendered organic life as we know it possible, and the demonstration of the high degree of improbability that such life exists on the planets of our system or the planets of other solar systems, are in great measure a beating of the air. We may perhaps admit that organic life as we know it would have been impossible had it not been for a series of events and circumstances that bear the very stamp of design. We may even admit that had the universe, taken as a whole, been different, had there been one star less or more, that series might, or perhaps could, never have happened. But to assert that the Almighty has limited His power to one physical basis of life is, as it seems to us, an absurd assertion. We traverse the whole position that Dr. Wallace has assumed. He has nowhere demonstrated that there can be but one physical basis of life throughout the universe; he wholly fails in this. The present writer prefers to imagine that there are an infinite variety of bases, and that in other systems there may be other forms of life growing from the lesser to the higher as we have grown, and that, in ways unknown, and probably unknowable, these forms of life are necessary one to the other, system to system,—as necessary as is every atom and molecule of the great material universe to every other atom and molecule. That there are many mansions in the City of God seems to us at least as noble a belief as that which Dr. Wallace so plausibly propounds.