Bibliographical Record.

Bastian on the Beginnings of Life.—In our April number we noticed the small work of Dr. Bastian, which acted as the precursor of the two large volumes now before us. As our space precludes us from the analysis of the work in detail, we shall only call attention to the two principal lines of argument adopted by Dr. Bastian, and adduce experiments on which he considers he has established his hypothesis, which, as our readers will recollect, was nearly identical with that of the “spontaneous” or “heterogenetic” origin of life on this planet.

The argument that “dead matter” (using this phrase in the sense employed by Dr. Lionel Beale) is capable of producing even from the centre of crystals of neutral ammonic tartrate, and in solutions containing ammonic silicate certain spores and filaments which have a considerable resemblance to those of true organic matter is developed at length. These organisms

“Have been either fungus filaments and spores similar to those represented in Figs. 29 and 36; Torulae, such as have been sketched in Fig. 28; various kinds of flagon-shaped bodies of a light brown colour (apparently budding out into filaments, and containing blocks of protoplasm within), or else roundish spores of very variable shape and size—some being smooth externally, others rough, and most of them having thick walls.”

In addition to these unmistakable organisms (which have, in some cases, been proved to be truly living) obtained from the saline solutions, other bodies have been encountered, whose real nature is deemed to be very doubtful. It may appear strange to some of our readers, that Dr. Bastian, who certainly has a desire to find life or living tissues in every imaginable spot, and under every variety of circumstances, has devoted a large portion of his space to argue, in spite of the opinion of our highest authority on fungi—the Rev. M. J. Berkeley—to prove that sarcina is not a real living organism. This argument rests upon the facts that sarcina has only been seen to undergo a process of growth and development, and never one of spontaneous fission, without which it can have no strict claim to be considered as one of

1 The Beginnings of Life; being some Account of the Nature, Modes of Origin and Transformations of Lower Organisms. By H. Charlton Bastian, M.A., M.D., F.R.S. Two volumes. London: 1872.
the lowest kind of living things; that sarcina met with in ammionic tartrate solutions like that from the stomach has always existed amongst the sedimentary deposits; and that in other ammionic tartrate solutions, in which sarcina has either been absent, or in minute quantity, a sedimentary matter has been found, having a very strong general resemblance to sarcina, though the appearance of this has been such as to lead to the belief that it is a kind of modified crystal rather than a living substance; and this sarcina, even when obtained from the human stomach, varies considerably as regards its ultimate pattern or arrangement.

Dr. Bastian is, however, not content with demonstrating a change in the particles of certain crystals, but also alleges that an undoubted vegetable growth (Vaucheria) of which the structure had become partially disintegrated, and the spores decolourised, some of the chlorophyle-corpuscles being colourless, and others still green, a conversion takes place in a mass, containing fatty looking particles and globules; which animalised mass becomes in time finely granular and somewhat smaller, next becomes segmental; is resolved into a worm-like embryo which exhibits very slow movements; and at last appears in a form well known as Diplogaster of Schultze, which in course of time lays eggs and propagates its kind like other nematoid worms.

The fact that animals

"With such distinct and specific organs, and of different 'sexes,' too, should arise in this definite manner from the reproductive products of a plant, will, doubtless, seem to many to flavour more of fable than of fact. After the observations which have been detailed, however, we must accept the occurrence of such phenomena as established facts—just as we are compelled, and are now quite accustomed, unhesitatingly to believe in the reality of other equally inexplicable phenomena. When we are able really to explain the reason of the processes by which one minute vesicular mass of fatty and albuminoid particles develops into a man, another into a fish, and another into an insect, we may then, with a little more show of reason, think of rejecting other more or less similar facts because they are incomprehensible."

Arguments of this kind form a very large proportion of those advanced in Dr. Bastian's work. His plea for the origin of life, by what he terms archebiosis, deserves, however, the most careful examination, and, as we have before said, it is only by the direct disproof of his facts that it can be controverted. The arguments of Dr. Bastian and the facts must be considered as two entirely different subjects of investigation.

It is hardly necessary to say that in the main Dr. Bastian agrees with the views of Dr. Grant as to the complex nature of the organisation in the higher animals, that e. g. the leucocytes, or "white
corpuscles" of the blood are practically the same as young amoeba, and capable of separate existence. Their death only occurs when the totality of the organism which supplies them with pabulum becomes incapable of nutrifying them. Such views, while they have the peculiarity of representing the teachings of a minority, are supported by a series of minute experiments. We shall take only one of these, and one likewise of the most remarkable.

In the brain of a patient who had died of rheumatic fever at University College Hospital, and in whom an exceedingly high temperature had existed for a few hours before death, there were observed, when the arachnoid was cut through, a large number of most actively moving particles.

"Many of these were mere spherical particles of various sizes, but others were distinct and large Bacteria made up of two almost cellular segments; and every portion of the pia mater that was examined showed similar moving particles and Bacteria. The brain was then covered with a bell-glass, and when portions of the pia mater—again taken from between previously unseparated convolutions—were examined after an interval of twenty-four hours, the large Bacteria had, considerably, increased in number, whilst the small spheroidal particles seemed to be as plentiful as before. When portions of brain substance from some central parts of the organ were also examined at this time, moving particles and Bacteria were seen to exist in the greatest abundance amongst the disintegrated nerve elements, which had probably been poured out from the blood-vessels."

From this observation Dr. Bastian proceeds to contend that these Bacteria must have existed in the blood of these vessels before the brain had been removed and before the skull was opened. Bacteria are not produced in any fluids under two or three hours.

"Their origin could not, therefore, have been due to Bacteria germs derived from the atmosphere, which, on removal of the skull-cap, had in some mysterious ways insinuated themselves into the blood-vessels. They must either have existed in the blood during life, or else they must have been produced de novo in this fluid after death. There is strong reason for believing that Bacteria existed in the blood during the life of the individual."

He, therefore, concludes that these objects were newly evolved by reason of changes taking place in the blood after death, in or near the situation in which they were found. He imagines that in all probability "if examination had been made" they would have been found disseminated throughout all other parts of the body, just as they were actually found in different portions of the brain. An inquirer might ask what reason could exist why further examination was not made to verify this important statement. The blood does not contain Bacteria during the life of the individual.
The researches of Dr. Burdon Sanderson ("fourteenth Report of Medical Officer of the Privy Council) seem to show that the blood and other parts of the body do not generally exhibit any zymotic tendencies. The following argument is adduced against the researches of Dr. Burdon Sanderson:

"There is a great tendency with others to conclude that Bacteria do not arise de novo, because there is no evidence of such occurrence when dealing with Pasteur's solution or a few other fluids, different from those in which the process is said to occur. Let any person, for example, repeat Dr. Sanderson's thirteenth [query third?] experiment ('Thirteenth Report of the Medical Officer of the Privy Council), with a strong infusion of hay or turnip, rather than with Pasteur's fluid, and then such results will occur that, from Dr. Sanderson's data, he will have no option but to admit that Bacteria do arise de novo. It is surprising that such an experiment was not tried in the face of all that has been said concerning the productivity of such fluids. The real laws by which contagion is regulated can never be adequately understood, unless one knows whether the contagia with which one is concerned can, under any circumstances, arise de novo. This seems to me to be the point which should be first ascertained."

We have now glanced at some of the principal arguments contained in Dr. Bastian's work. We are confident that neither the medical profession nor that section of the scientific and often non-scientific public which occupies itself with what are called physiological questions, will accept Dr. Bastian's statements without much careful examination. It is necessary that all his experiments, amounting to more than a thousand, should be repeated by some one who takes no share in the polemics of the day. It is also necessary that, before these experiments are rejected, some counter facts shall be conclusively proved which will satisfactorily demonstrate the truth of the assumptions held by Schleiden, Schwann, and the last generation of physiological teachers.

The Martyrdom of Man.—To review a work which passes over such an enormous number of distinct subjects as does that of Mr. Winwood Reade, and which in part trenches on the domain of the student of ancient history and of the theological reader, would in these pages be an impossible task. We have to look upon the author chiefly as an anatomist, as an anthropologist, as a zoologist, and as an antiquary; and if the examination of his pages leads us to express some doubt as to the nature and value of the facts he considers himself to understand, we may leave to other hands the task of examining his qualifications to write down the metaphysic or the theology of the majority of our educated countrymen. His chief