ance is pleasing and often beautiful, their characters are generally very clear and distinct, so that the discrimination of the species is by no means difficult, and their

PAINTED LADY (*Pyrameis Cardui*).

Painted Lady. Var. 1.

Natural History is easily studied; whilst the small number of the species renders it an easy matter for the beginner to procure in a season or two by far the greater proportion of the known forms.

Although there are already many books treating specially of the British butterflies, some of them expensive, and others so cheap as to come within the reach of every one, we cannot blame Mr. Newman for adding one more to the number, especially as his work is distinguished by the great prominence given in it to the Natural History of the species. Upon this subject, as also upon the distribution of the species in Britain, Mr. Newman has long been publishing details from his own observations and those of other naturalists, in his periodicals the "Zoologist" and "Entomologist," and the whole of the information thus accumulated is here summarised and supplemented with observations derived from other sources. Another useful feature in the present work is the insertion of notices, and frequently of figures of the more important varieties of each species, which will often relieve the young student from a state of puzzled suspense in the determination of his specimens. The classification adopted is founded, in its broad outlines, upon the preparatory states of the insects, but it leads pretty nearly to the same results as the system more generally followed.

The illustrations are very numerous, including figures of all the species and of both sexes when there is any difference either in the upper or lower surface. They are all woodcuts, and are generally well executed, as may be seen from the examples which we are enabled to give.

W. S. DALLAS

OUR BOOK SHELF

The Western Chronicle of Science. Edited by J. H. Collins, F.G.S., Secretary to the Royal Cornwall Polytechnic Society. January to June, 1871. (Falmouth. Pp. 96.)

WE are glad to afford space for a short notice of this cheap scientific journal, which, although specially intended for the benefit of the mining population of Cornwall and West Devon, deserves a wide circulation in all our mining districts. Each monthly number contains one or two original articles, either on general subjects, as "The Practical Value of Scientific Knowledge," or giving descriptions of various forms of machinery, followed by notices of books, and a monthly chronicle of science. From one of the editorial articles on "The Practical Value of Scientific Knowledge," we learn that a good stoker may effect an annual saving of nearly 35% per annum over a bad one, and that it is a common Cornish habit to hang heavy jackets, great coats, &c., on the lever of the safety valve of engines devoid of a pressure gauge; while the farmers, with the view of giving their ground two good things at once, mix lime with their guano some days before spreading the manure. A very remarkable natural-history statement is made by Mr. Williams, of Hayle, in his paper on "Scientific Nursing." "I have (he says) in my possession a double chick, the produce of an egg laid by a barn-door fowl, one half being the natural species, the other half composed of the sparrow-hawk!" Until this remarkable chick appears *in propria persona* at the office of NATURE, or, at all events sends us its photograph, we must, with much regret, decline to accept the fact.

Medizinische Jahrbücher. Herausgegeben von der K. K. Gesellschaft der Aerzte, redigirt von S. Stricker. Jahrgang, 1871, Heft I. und II. Mit 26 Holzschnitten und 2 lithographirten Tafeln. (Vienna: Braumüller; London: Williams and Norgate, 1871.)

THE two parts before us are the continuation, in a new form, of an old and valuable periodical, and, under Prof. Stricker's able editorship, its tendency, instead of being, as heretofore, chiefly clinical, will be so far modified as to embrace all the results obtained in the physiological laboratory. A glance at the table of contents is sufficient to prove the truth of this statement. Thus putting aside the first paper by Prof. Stricker, entitled "Pathology and Clinical Observation;" the rest, nine in number, are nearly all devoted to the results of microscopic research. Thus, Dr. Genersich contributes a paper on the Serous Canals of the Cornea; Dr. Heiberg one on the Regeneration of the Corneal Epithelium; Dr. Güterbock one on Inflammation of Tendons; Dr. G. F. Yeo one on the Structure of Inflamed Lymphatic Glands; Dr. Lang one on the First Stages of Inflammation in Bone; Dr. Albert and Dr. Stricker one on Surgical Fever, and the latter author another on the nature of the Poison of Pus, and so on. The journal leads off with a good start, and if it continues as it has commenced, will probably take up a leading position. We notice one or two of the papers that appear to be of general interest. H. P.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his Correspondents. No notice is taken of anonymous communications.]

Cotteau's "Echinides de la Sarthe"

A NOTICE of Cotteau et Triger's *Echinides de la Sarthe* in a recent number of NATURE (June 15, p. 120) is likely to convey a false impression of the accuracy of M. Cotteau, and throws considerable doubt on the value of his work. It is not often that French scientific men are as conscientious as he is in the examination of authentic types. There is hardly a collection of fossil Echini which M. Cotteau has not examined; and his

thorough acquaintance with all that has been written on his subject, as well as his intimate correspondence with the principal echinologists, is a sufficient guarantee that no important memoir (such as Wright's monograph) could have escaped him. Anyone who will take the trouble of turning to Cotteau's work (p. 111) will find, under *Pseudodiadema hemisphericum*, a notice of Dr. Wright's figure of the same species (so much superior, with many others, to Cotteau's?) and a reference to his description. Nor is this an isolated case. Throughout the work M. Cotteau discusses and criticises more or less the results of this very monograph, said to have been overlooked by him. The mistake Cotteau is accused of making of assigning to Desor instead of Agassiz the specific name of *Pseudodiadema hemisphericum* is entirely unfounded. Referring again to p. III., we find, as a synonym, *Diadema hemisphericum* Agass. M. Cotteau, like many continental and American writers, does not interpret the notation of species as is required by the laws of the British Association, but for that reason he should not be accused of committing mistakes which his own writings show him not to have committed. M. Cotteau, in common with others, looks upon nomenclature simply as a matter of registration; and when M. Desor transfers to *Pseudodiadema* the *Diadema hemisphericum* Agass., M. Cotteau writes, therefore, *Pseudodiadema hemisphericum* Desor, and not Agassiz; he may be wrong, according to the principles of the writer in NATURE, but he has not, either in this instance or in the other cases alluded to, committed a mistake through ignorance of the subject.

A. AGASSIZ

Mr. Howorth on Darwinism

MR. HOWORTH sneers at "Survival of the Fittest" as an "identical expression" which "might have suggested itself even to a child," an axiom, in short, of which the truth cannot be disputed. This is satisfactory; but it is strange that he did not apply this axiom to his own theory, and see how they agreed together. He would probably admit, as another discovery "that might have suggested itself to a child," that as a rule the entire offspring of each animal or plant, except the one or two necessary to replace the parents, die before they produce offspring (this has never been denied since I put it prominently forward thirteen years ago). He would further admit, I have little doubt, that a great majority of animals and plants produce during their lifetime from ten to a thousand offspring, so that fifty will be a low average, but the exact number is of no importance. Forty-nine, therefore, of every fifty individuals born, die before reaching maturity; the fiftieth survives because it is "best fitted to survive," because it has conquered in the struggle for existence. Will Mr. Howorth also admit as self-evident, that this one survivor in fifty is healthy, vigorous, and well nourished, not sickly, weak, or half-starved? If he maintains that it is the latter, I shall ask him to prove it; if the former, then what becomes of his theory as an argument against Natural Selection? For, admitting as a possibility that his theory of the greater fecundity of the weak, &c., is true, how are these weak or sickly parents to provide for and bring up to maturity their offspring, and how are the offspring themselves (undoubtedly less vigorous than the offspring of strong and healthy parents) to maintain themselves? The one in fifty who survives to leave descendants will inevitably be the strong and healthy offspring of strong and healthy parents; the forty-nine who die will comprise the weaker and less healthy offspring of weak and sickly parents; so that, as Mr. Darwin and myself have long ago shown, the number of offspring produced is, in most cases, the least important of the factors in determining the continuance of a species.

I have thought it better to go thus into the heart of the question, rather than defend myself from the charge of dogmatism, for stating as a fact that the most vigorous plants and animals are the most fertile. I repeat the statement, however, referring to Mr. Darwin's observations, and especially to those in which he demonstrates by experiment that cross-breeding produces the most vigorous and luxuriant plants, which again produce by far the largest quantity of seed. The facts that wild animals and plants are, as a rule, healthy and vigorous, that the head of the herd is the strongest bull, and that weak and sickly carnivora are rarely found because they must inevitably starve to death, sufficiently refute Mr. Howorth's theory as against Natural Selection. If he can point to any district upon the earth where the animals and plants are in a state of chronic debility, disease, and starvation,

I may admit that there his theory holds good; but such a district has not yet come under my observation, or, as far as I am aware of, been recorded by any traveller.

I still maintain (Prof. Jowett's authority notwithstanding) that the phrase "Persistence of the Stronger" does not truly represent "Natural Selection" or the struggle for existence; and, though it may often be true, is not the whole truth. The arguments of Mr. Howorth from the history of savages will, I think, not have much weight, if we may take as an example his putting together as cause and effect the extinction of the Hottentots and their now obtaining enough to eat.

ALFRED R. WALLACE

MR. ALFRED WALLACE directs attention to the gross error of supposing that "the struggle for existence means the persistence of the stronger," and correctly stigmatises this view of Mr. Howorth's "a pure misrepresentation."

It is, as Mr. Wallace remarks, very curious and even ludicrous, after all that has been said and written upon the matter, that anyone should fail to recognise the advantages to their possessor of "obscure colours," "cunning," "nauseousness," "bad odour," and other qualities superior to strength alone. The creature having these properties, at last brought to perfection through the operation of natural selection, acting through countless generations, will assuredly have the advantage in the battle of life over its less fortunate neighbours. It will survive in the struggle for existence. Having survived, is it not better that it should at once teach the world the law of its survival, and proclaim itself the fittest to survive, than that it should remain silent until those whom it has destroyed may rise from the dead and admit that their doom was deserved because they were not fit to live?

LIONEL S. BEALE

MR. HOWORTH, it seems to me, has not chosen a very favourable time for so strongly maintaining the truth of Mr. Doubleday's theory, seeing that the recent census has shown that the population of England has increased not only with an increment absolutely greater than that shown by any previous census, but also—and this is still more important—with an increase proportionally greater than during the last decade. Yet never, surely, has luxury been so prevalent among us as during these last ten years. The evidence thus afforded will perhaps be deemed more conclusive than the argument of Mr. J. S. Mill, who invites those who may be inclined to accept Mr. Doubleday's opinions "to look through a volume of the Peerage, and observe the enormous families almost universal in that class; or call to mind the large families of the English clergy, and generally of the middle classes of England" ("Principles of Political Economy," bk. 1, ch. x., note). Mr. Howorth, however, states that "the classes among us who teem with children are not the well-to-do and the comfortable." If this statement were absolutely true, it would be of little service to Mr. Howorth, since it is in the classes referred to that prudential restraint acts with the greatest force, and the effects of this restraint, both direct and indirect, would have to be taken into account before his conclusion could be admitted. He further asserts that "a state of debility of the population induces fertility," since "where mortality is the greatest there is much the greatest fecundity." That births should be most numerous where the mortality is greatest, requires for its explanation no hypothesis respecting the fertilising power of debility. "The fact," says Malthus, "may be accounted for without resorting to so strange a supposition as that the fruitfulness of women should vary inversely as their health. . . . When a great mortality takes place, a proportional number of births immediately ensues, owing both to the greater number of yearly marriages from the increased demand for labour, and the greater fecundity of each marriage from being contracted at an earlier, and naturally more prolific, age" (vol. 1, pp. 472, 473, 5th edit.). Man's reproductive power is always in civilised life more or less checked, and ready to be more or less exercised in proportion to the lessening by death of the restraining pressure.

THOMAS TYLER

MR. WALLACE, in replying to Mr. Howorth's objections to the theory of Natural Selection, points out that that gentleman first misrepresents Darwinism, and that having done so he does not employ the distorted doctrine as premises to a further con-