

a much larger quantity. Here again we may observe the instance Mr. Bennett quotes, the mimicry of *Leptalis* to *Ithomia*. *Leptalis* is normally a white insect, and as such, would be more liable to attacks from its persecutors, as shown by Mr. Wallace, while any variation which gave colour to the wing would make the insect less conspicuous, and being useful to it, would be preserved.

That we are quite ignorant of the laws regulating variation is quite true, and that when we do understand them it will throw much light on these questions is undoubted, and that we may probably find in them some additional explanation for many of the facts now accounted for by Natural Selection; and Mr. Bennett does good service in the cause of truth in reminding us of what still has to be done.

London, Nov. 17

S. N. CARVALHO, JR.

FOUR years ago I advanced the opinion that Natural Selection is insufficient to explain the "Origin of Species," and that, rather, the origin of the variations of which Natural Selection is said to avail itself must be looked to for this purpose. I may perhaps, therefore, be allowed to say a few words in examination of Mr. Wallace's explanation of this point in last week's NATURE.

One of the objects of Mr. Darwin has been to show that the existence of species as an absolute entity is a mere idea of our minds; that if we could at the same moment look around us in space, and also backwards in time, we should find the organic world connected together as one whole, one great mass of beings extremely closely allied to each other, and distinguishable only by an accumulation of small and perhaps scarcely appreciable differences. A second and closely-connected object has been to show that this great mass of beings has had a common origin from one primeval ancestor (or at most a few ancestors). These two points are the chief ones involved in the "Origin of Species" question, as it is *ordinarily understood*; and if they be borne in mind, it will be seen that the doctrine of "Natural Selection, or the Survival of the Fittest," deals with only a small portion of the numerous problems involved in this great question. I am sure that Mr. Wallace, after having written as he has done about man, that in his case other influences than this survival of the fittest have been at work, may reasonably allow importance to other powers than Natural Selection in the case of other organic beings.

If Mr. Darwin's book had been entitled "The Influence of Natural Selection on the Formation of Species," some misconceptions might, perhaps, have been avoided. Its present title undoubtedly tends to convey the idea that Natural Selection is *per se* the Origin of Species. I believe Mr. Darwin, however, holds no such idea.

The picture above alluded to, of a complicated mass of beings connected together by innumerable gradations, is so different from what we find existing around us, that one of the first questions suggested by it is, where are the connecting links? This first question has never yet been answered to any extent, or with anything like adequacy. The links produced are but few, and not sufficient to bear the great weight attached to them. For at no period of the geological record do we find any traces of the general and intimate connection of beings with one another that Mr. Darwin's views would lead us to look for. The creatures composing the organic world at any one given moment were, so far as the evidence of geology goes, separated from one another by lines of demarcation of similar value to those existing among animals now.

What is wanted to explain the phenomena of various limited and defined species arising from one common ancestor is, then, first, a law, or group of laws, to throw light on the origin of variation and dispersion; and, second, another law or laws to explain the limitation and separation of the varieties so produced. It is quite out of the question to suppose that the theory of Natural Selection does all this. Those, however, who have studied Mr. Spencer's work will be well aware that his theory of evolution may be applied to deal with the question in this its more extended light. And I believe that those who wish well for the survival of Natural Selection will do well to insist on its only being considered in connection with a more extensive doctrine of evolution. This is where I think Mr. Wallace errs in his advocacy.

I will not here allude to the question of mimicry more than to say, that Mr. Wallace has never answered, but rather avoided, the chief difficulties I have advanced against it; and that his theories on the subject are undoubtedly open to the objection

that he insists on seeing all the phenomena from the point of view of a natural selectionist, and nothing more. As Mr. Wallace has, however, already discovered that Natural Selection, though applicable to man, is not sufficient, un-supplemented, to account for him, we may hope that he will yet see this with regard to the rest of the organic world.

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The Chromosphere

WHILST mapping down, in preparation for the coming eclipse, all the bright lines that have so far been observed and accurately measured in the chromosphere or solar prominences, I was struck with the absence of a faint yellow line, which I have myself several times observed whilst examining the contour of the sun's disc. This line is probably identical with Angström's absorption line 5883^o (spectre normal du soleil), D'' lying almost midway between D' and the line in question. There is no danger of mistaking it for the bright yellow line seen in every solar prominence, and lying near Angström 5865^o, since the two yellow lines were seen on each occasion at the same time on the more refrangible side of D''.

I suppose the D''' mentioned in a late communication from Dr. Young, to be identical with the bright yellow line, for it is most improbable that he could have failed either to see or to record the bright line whilst mentioning the faint one, since the latter, as far as at least as I have observed, is never visible unless in company with the former.

The only observation that I can at all identify with my own is that mentioned in NATURE, December 16, 1869, where Mr. Lockyer, speaking of the absorption line, which corresponds to the orange line of the chromosphere, says that Padre Secchi's bright line is less refrangible.

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From London to Catania

A FEW practical details as to the best way of getting to Sicily, the accommodation to be found there, &c., may be of use to many readers of NATURE who are thinking of going there next month.

We have first the sea passages from London, Southampton, or Liverpool, to Messina or Malta, of which if any be chosen it will probably be that from Southampton to Malta by the P. and O. steamers, which start every Saturday at 2 P.M., and are nine days on the voyage. (Fares 20*l.* and 10*l.*) From Malta there are steamers twice a week to Messina; they touch at Catania when the weather permits them to enter the small harbour, otherwise they go on to Messina, so that passengers for Catania must in that case avail themselves of the railway.

Few probably will wish to go the whole way by sea, the land route therefore by which the Indian mails are now sent will be taken; viz., over the Brenner Pass. The night mails leave Charing Cross at 8.45 P.M., Cannon Street at 8.50 P.M., Victoria and Ludgate Hill at 8.30 P.M., and arrive in Dover in time for the Calais and Ostend boats; the line from Calais to Brussels may not be practicable, and so the longer passage to Ostend may be preferred; by going straight on one ought to arrive at Cologne at 4 P.M. the next day (if one goes by Calais one has three hours' rest at Brussels). The day service train, first and second-class, leaves all the stations at 7.40 A.M., and one should arrive at Cologne *via* Ostend at 10.55 P.M. (*via* Calais at 4.50 A.M. next day.) From Verviers to Cologne there are only first-class carriages in this train. The fares to Cologne by Ostend are 3*l.* 8*s.* 10*d.* first, and 2*l.* 9*s.* 5*d.* second-class, by Calais they are 3*s.* or 4*s.* more.

Those who like to go from London to Ostend or to Antwerp *direct* can leave St. Katherine's Wharf by steamer on Sunday, Tuesday, or Thursday mornings for Antwerp, or on Wednesday or Saturday mornings for Ostend, and proceed by rail to Brussels, the fares from London to Brussels being 30*s.* first and 22*s.* 3*d.* second class, *via* Antwerp; 26*s.* 8*d.* first and 20*s.* 10*d.* second class, *via* Ostend. The fare from Brussels to Cologne is about 25 francs first and 18 francs second class by the ordinary trains; express about three francs more.

The way then is by Coblenz, Mayence, Darmstadt, and Aschaffenburg to Munich. By leaving Cologne by the 6 A.M. express, one ought to get to Munich at 9.10 P.M. In times when through-tickets are granted the fare by Ostend and Cologne to Munich is 6*l.* 7*s.* 3*d.* from London (first class), and 5*l.* 10*s.*