generalisation as to the probable gold-bearing nature of the Australian quartz-country, and as to the probable aspect of the interior of Africa, are probably familiar to most people. But in later years what has especially brought his name into prominence is the chivalrous devotion with which he has maintained one might almost say the national belief in the welfare of Dr. Livingstone. Yet this is only a sample, though one which has come more publicly before us, of the tenacious friendship and active benevolence which have always marked him. As President of the Geographical Society—a society which is in a sense his own creation—he had frequent opportunities of befriending not only the cause of geography but the personal well-being of travellers, and he never failed to use them. The geographers have good cause to lament the death of their chief.

Of the man himself, what he was as he lived and moved among us, his loss is too recent to permit us justly to speak. We can only think of him as the stately courteous old gentleman, carrying even to the last that military bearing which dated from the days of Wellesley and Moore, kindly and thoughtful in his kindness—a man whose friendship, once given, even ingratitude and injustice could not wholly alienate. He was not without some of the littlenesses of humanity, but they were so transparent, and often even so child-like, that we forget them in the recollection of all the goodness of heart and strength of head and nobility of nature which have gladdened us for so long, but which are now only subjects of tender remembrance.

ARCH. GEIKIE

HOMOPLASY AND MIMICRY

ALL students of the remarkable phenomenon of superficial resemblances in the animal and vegetable kingdom will be glad that Prof. Dyer has published an extension of the paper which he read on this subject at the Edinburgh meeting of the British Association. It is especially satisfactory that he has abandoned the very objectionable term "pseudomorphic," and substituted that of "homoplastic," a very much better term, because it simply expresses a fact without committing one to any theory. There are, however, one or two points in his paper of last week, on which I should wish to be allowed to comment.

Prof. Dyer holds that the distinction between "mimicry" in animals and "homoplasy" in plants, is "sufficiently obvious," the difference assigned being, apparently, that in the one case it takes place between species found in the same locality, in the other between species unconnected geographically. I doubt, however, whether facts will warrant this distinction. The most remarkable instances of "mimicry" among animals hitherto published are, undoubtedly, in the case of species inhabiting the same area; but I am inclined to think that, when attention is called to the subject, others will be found between animals not so associated, though these instances would naturally not attract so much observation. And secondly, homoplasy in plants does frequently occur in species occupying the same area. The statement reported to have been made by Prof. Dyer at Edinburgh that "the resembling plants are hardly ever found with those they resemble," would scarcely be borne out by a careful investigation. The real objection to the terms "mimicry" and "imitation" is that they seem to imply a *conscious* effort at convergence, which will hardly be conceded in the case of Lepidoptera any more than of Ferns. The substantial difference between the two is that, in the case of animals, the resemblance appears to be protective, while in the case of plants, there is seemingly no such benefit arising from it; but this is a difference in result and not in the nature of the phenomenon itself. I fail to see that the objections to the use of these terms in the case of

plants do not equally apply to animals; we have no reason to suppose that the two sets of phenomena are not produced by similar causes.

Prof. Dyer states, and no doubt truly, that the external resemblances of plants may frequently be traced to the effect of similar external conditions, and quotes in support Mr. E. R. Lankester's view with regard to animals. But in assuming that this explanation will account for all such phenomena if fully investigated, I think too much is assumed. Cases of homoplasy are referable to two distinct classes—resemblances in general habit, and resemblances of particular organs. The former, as in the case of the homoplasy between a *Cactus* and a *Euphorbia* or a *Stapelia*, or between a *Kleinia* and a *Cotyledon*, are no doubt due to the operation of similar external conditions of climate and soil. But in the second class this explanation wholly fails.

As illustrations of the kind of resemblance I mean, I may refer to the two collections of "mimetic plants" exhibited by Mr. W. W. Saunders at the two last *soirées* of the Linnean Society, a list of which will be found in *NATURE* for May 26, 1870, and May 4, 1871. The extraordinary resemblance in the markings of the leaves in plants thus grouped together, might well deceive the most experienced botanist. To account for this homoplasy on the ground of similar external conditions, is to start a mere hypothesis, without any facts to warrant it. A still more curious series of resemblances occurs in the case of fruits than of leaves, so close that it has deceived botanists of the experience of the elder Hooker, Bentham, and Kunth into placing species in a genus with which they have no structural affinity whatever. I have in my mind in particular two samaroid fruits, both from the forests of Brazil, so absolutely identical in external facies, that distinction is quite impossible without dissection, and yet belonging to exceedingly remote orders. I will not, however, say more on this point, as it would be impossible to appreciate the closeness of the homoplasy without drawings, which I hope shortly to be able to publish. The singular part of this resemblance is, that, as far as we know, it is never protective. In our Bee-orchis we have what might well have been assumed *primâ facie* to be a case of protective resemblance, the flower being so fashioned in order to attract bees to assist in its fertilisation. It is remarkable, however, that the Bee-orchis is one of the few plants that appear to be perpetually self-fertilised, never being visited by insects. It is just possible that we have an instance of protective or rather beneficial resemblance of scent in the case of the carrion-like odour of the flowers of *Stapelia*, which attracts blue-bottle and other flies.

In a paper read at the recent meeting of the American Association for the Advancement of Science, by Prof. E. D. Cope, I find the following thoughtful remarks:—"Intelligence is a conservative principle, and will always direct effort and use into lines which will be beneficial to its possessor. Thus, we have the source of the fittest, *i.e.*, addition of parts by increase, and location of growth-force directed by the will, the will being under the influence of various kinds of compulsory choice in the lower, and intelligent option among higher animals. Thus intelligent choice may be regarded as the originator of the fittest, while natural selection is the tribunal to which all the results of accelerated growth are submitted. This preserves or destroys them, and determines the new points of departure on which accelerated growth shall build."

Biologists generally are, probably, hardly prepared to apply the terms "intelligence" and "will" to the vegetable kingdom; but the use of the term "vegetable life" seems to me to imply of necessity that there are powers at work in the economy of the plant, as of the animal, which it is vain to attempt to reduce to manifestations of the forces which govern the inorganic world.

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