THE NATURALIST.

TELEGONY AND HEREDITY.

ONE OF THE MOST INTERESTING exhibits at the Royal Agricultural Show was that of Professor Cossar Ewart, showing the continuous progress that he has made in his experiments for the purpose of illustrating the problems which are involved in the consideration of heredity and telegony. The exhibition included not only the hybrid zebras with which the public are more or less familiar, but other animals which had been the subject of experiment, such as cats, rabbits, and pigeons. The exhibition was rendered much more instructive to those who are interested in the consideration of these matters, which all breeders should be, by the publication of a guide of some sixty pages illustrated by forty well-executed and accurate engravings, mostly from photographs of the animals exhibited. Professor Ewart must be regarded as one of the most active of the iconoclasts. He crushes remorselessly, by the aid of indubitable facts, a very large number of the opinions that prevail amongst breeders. He says in his concluding remarks that it will be evident that not a few of the favourite articles of the breeders' creed rest on unstable foundations, and, in fact, some of the most cherished convictions of breeders and fanciers have no foundation whatever. He wonders that the belief in the influence of a first sire and in mental impressions on the female parent and in other popular delusions have so long prevailed, and that long ere this some systematic attempts have not been made to test the truth of the theory of what is known as telegony, or the influence of a previous sire.

Those most interested in breeding have done nothing to ascertain what should be well known as the principles of their art. Scientific methods are rarely considered by practical men in England, whilst in Germany the neglect of science by the English Government and by English breeders is regarded as quite incomprehensible. But few experiments of an important kind have been made on the causes of variation, on the influence of inbreeding, or on the nature of prepotency in either parent. We have, however, gone back on preconceived notions which have no foundation in fact. Thus it is constantly maintained in journals devoted to live stock that the breeding of mules in England is undesirable because the mares would be infected by the first sire, and that our stock of horses would be rendered mulish. The doctrines brought forward by Orton in his *Physiology of Breeding*, and by James Howard, two noted breeders of the present century, and more recently by Sir Everett Millais, a well-known authority amongst fanciers, are regarded by Professor Ewart as superstitions, not supported by facts, nor by an examination of the internal structure or external form of animals.

Passing over for the present the zebra hybrids, I may call attention to a few of the animals which formed so great an attraction at York. One of these was Fatima, a filly bred by Mr Wilfred Blunt. She is an Arab of the purest blood without even the suspicion of a trace of zebra ancestry, but she has a dorsal stripe and distinct bars on both fore and hind legs and vestiges of shoulder stripes. Fatima was exhibited in order to prove that stripes in the horse do not indicate any trace of the mother having previously had a striped foal by a zebra. But had such a striped animal been produced by a mare that had previously been mated with a zebra it would have been accepted as a distinct proof of telegony, whereas, as Professor Ewart states, it is merely an evidence of the reversion to the striped ancestors of those horses of primeval form that existed in distant ages.

An interesting example of the same kind was a cage of kittens and their dam. This exhibit was the result of rearing two white cats, full brother and sister, for their whole lives in close confinement—so that no crossing was possible—and breeding from them. The white cat was exhibited and her four kittens, two, a male and female, being perfectly white like the parents, and two, also male and female, being well-marked tabbies, these latter taking their colour from their great grandmother. It is obvious that had the mother of these four kittens had a previous litter by a tabby sire they would have been regarded as furnishing an indisputable proof of telegony, whereas they merely furnish an example of heredity in throwing back three or four generations.

Another series of examples of a most interesting character were shown in the pigeons exhibited. A crossbred (Jacobin and Barb) hen, when quite young, was mated with an aged Turbit, and three pairs of their progeny were exhibited. The first pair, bred when the crossbred hen was barely mature, closely resembled the old mature male parent; but as the hen grew older and more mature the offspring produced bore more and more a resemblance to her or to her ancestors, thus showing that the age of parents may bear a very important part in settling the condition of the offspring. Other birds were exhibited showing that inbreeding in pigeons, as in other animals, does not diminish their fertility, but leads to a reduction in size and a marked loss of vitality and vigour.

That the doctrine of telegony is one that influences breeders is proved by some amusing anecdotes related in Professor Ewart's guide. He writes:

> Quite recently in the south of Scotland an intelligent and successful breeder greatly fancied a particular bull. When, however, this breeder learned the bull had been running with cows of a different strain nothing would induce him to complete the purchase. This might be regarded as the belief in telegony run mad, yet many others would have followed the same course.

Professor Ewart also quotes the case of the American mare Sweepstakes, who was the dam of Star Pointer, Hall Pointer, and other famous horses. Sweepstakes was used for breeding mules before some of her famous offspring were born, proving that there is no excuse for the fear of contamination which so affects breeders of race-horses in England. Of the ten mares which have been mated with the Burchell zebra Matopo in Professor Ewart's experiments there is not one that shows the slightest trace of any infection in the subsequent progeny, either in colour, mane, tail, hoofs, voice, or disposition; in his own experiments with horses, cattle, sheep, dogs, cats, rabbits, mice, guinea-pigs, ducks, fowls, or pigeons, he has never had one single example proving the truth of this generally believed and widely acted upon doctrine.

I was at one time a not unsuccessful breeder of varieties of fowls and pigeons, and had occasion to note the results of my experiments very carefully, for it was my privilege to be a friend of Darwin, and to make experiments in breeding for him. I also reared several new varieties, some of which still hold their own amongst fanciers. Pigmy pouters, rumpless bantams, black-crested white Polands, &c., were originated by me, and obtained high honours in the show tent. I mention this to state that all my results were obtained by utterly ignoring the doctrine of the influence of a previous sire. Again, I may quote an example which affects the human race. Before the abolition of slavery in the southern states it is well known that it was a constant practice for young negresses to be strictly reserved as the mistresses of their white masters. When they became older they were discarded and married with men of their own race, but no one ever heard of the doctrine of telegony being supported by these practices.

W. B. TEGETMEIER.

THE WHITE RHINOCEROS.

WE HAVE MUCH PLEASURE in printing below two letters on the subject of the white rhinoceros in Zululand. One is from the Hon. Sir Walter Francis Hely-Hutchinson, Governor of Natal; the other from Mr C. R. Saunders, Chief Magistrate and Civil Commissioner in Zululand. Though despatched independently these letters reached us at the same time. They bear strong testimony to the interest taken by both gentlemen in the matter, especially when one considers that at present so many things of a troublous nature are occupying their attention.

SIR,—Mr C. R. Saunders, Chief Magistrate and Civil Commissioner in Zululand, writes to me as follows: "May 29, 1900. I was near the junction of the Umfolozis a few days ago, and although there is still some big game there (the buffalo, koodoo, and inyala have been nearly exterminated by rinderpest), I saw only one tsetse fly. I rode up to within fifty yards of five white rhinoceros, right in the open; then got off my horse and went to within twenty yards, and watched them for two or three minutes before they took any notice of me. After some time they moved off quietly, quite unconcerned. It was a grand sight, and one seldom seen, I fancy, nowadays."

This may be of interest in view of the allegations which have been made that the white rhinoceros no longer exists in Zululand. Mr Saunders has great experience of the South African fauna, having himself shot specimens of most of the different species. He is not likely to have been mistaken in this matter, especially as he got so close a view. I may mention that the white rhinoceros in Zululand are strictly preserved. Permission is never given to shoot them.

WALTER HELY-HUTCHINSON.

Government House, Natal, June 1.

SIR,—It may interest some of your readers to know that a few white rhinoceros (*Rhinoceros simus*) are still to be found in this province of Natal. On the 24th inst. I happened in the course of my duties to be in the game preserve No. 4, which is situate in the unoccupied country immediately above and between the confluence of the Black and White Umfolozi rivers, when five of these animals were observed about half a mile distant. The magistrate of the district (Mr Wheelwright) and myself were together on horseback at the time, and decided to ride towards the interesting objects, which were walking slowly towards some open thorn bush, and see how close they would allow us to approach. We thus got to within fifty yards of where they were then standing in a bunch, in short grass on open ground, with only a few small trees dotted about. As they took no notice of our approach on horseback we dismounted, and, leaving our horses with some natives who had accompanied us, walked up to within twenty yards, and gazed for several minutes at one of the most interesting sights it has been my fortune to witness, and one which I venture to think is seldom to be seen at the present time, with these animals so nearly extinct as they appear to be.

At such close quarters we could naturally observe every movement of the huge pachyderms; that they were the large, square-lipped, grass eating variety, there is not the slightest question. For a minute or more they appeared quite unconscious of our proximity, although we had walked straight towards them without attempting to take advantage of what little cover there was. After a while they began to sniff about as if suddenly discovering an unwholesome taint in the air. What little wind there was was in our favour. Now and again one would take a few steps towards us, but, although it was a bright day and we were standing quite in the open, they did not appear to see us. After the lapse of two or three minutes at least, the five began moving about in an uneasy manner, still gazing in our direction. So near were we that the blinking of their small eyes was easily seen. They still appeared to be unable to decide whether they were in any danger, but eventually moved off, first in a walk, subsequently breaking into a slow trot. As they took an oblique course from where we were standing we rode to intercept them and got even nearer than before, and watched them trot out of sight, more like great pigs than anything else I can compare them to. A swarm of tick-birds, which we had observed scrambling over their huge carcases, rose into the air, but soon lit again on an old bull, who was not too pleased with their attention, and attempted with several pig jumps to free himself from his tormentors. The birds, however, were most persistent, and, clustering on his haunches, remained there.

The group consisted of four full-grown animals (one of which was a very large bull) and one more than three-parts grown. The mature animals carried fair-sized horns, those of the large bull being particularly massive at the base. On the same day our natives saw three others of the same species, a cow with a young calf and a bull. In this particular locality there are, probably, ten of these animals, and, so far as I am able to say of my own knowledge, that is the only spot in this province where *R. simus* is still to be found. A few are supposed to exist near the southern slopes of the Ubombo range of mountains, but as several of the black or prehensiled lipped species (*R. bicornis*), are still found in that locality, I am inclined to doubt whether those supposed to be *R. simus* are of that variety. At any rate I have never seen one there, neither have I seen the usual indications of their presence in that neighbourhood, always discernible in the shape of their excreta, which is easily distinguished from that of the prehensiled lip variety. The reserve in which the five were seen is almost in the heart of this province. They are as strictly preserved as circumstances will permit—the Governor of the colony even not possessing power under our game law to grant permission to kill them. The penalty for killing or attempting to kill one is a fine of not less than £50 or more than £100, with an alternative of imprisonment. Added to this is a penalty for shooting in any of the reserves, of which there are four, without a licence, and no licences are granted to shoot in this particular reserve.

About three years ago two European poachers went into the reserve and shot two of these animals—a bull and a cow (the latter in calf). They were detected and heavily fined, but their accomplices, who were more to blame than themselves, unfortunately escaped. The remains of the animals, not having been properly preserved, were useless as specimens. The question of the effectual preservation of these few *R. simus* appears to be one well worthy the serious consideration of the International Big Game Conference. That noted authority on all South African game, Mr F. C. Selous, in his interesting contribution to the *Great and Small Game of South Africa*, I believe, estimates the number of these animals now living at about twenty. The few here, therefore, comprising as they do a large proportion of the last of their race now in existence, must naturally be objects of considerable interest, and are worthy of every effort for their preservation. Should these remarks be the means of attracting useful attention in that direction, my object in writing will be attained.

C. R. SAUNDERS.

Eshowe, Zululand, Natal, May 31.

THE SEA LAMPREY.

SIR,—I have read with much interest Mr Tegetmeier's article in the *Field* of June 16 on the subject of the sea lamprey, and think the following, even if not bringing any fresh light on the subject, may interest you. Last year, when trout fishing in the River Otter at Budleigh-Salterton with Mr J. E. Smart, the latter noticed what he took to be a dead salmon lying at the bottom of the river. He pointed it out to me at the end of the day (about five hours after he first saw it), and I went down to get a closer look at it. Its outline was only indistinctly visible, but I thought I noticed it move, and so tried to put my landing net under it. On being touched it at once sheered off into deep water, swam round in a circle, and came back close to the bank. I then managed to get it out with our two landing nets and found it to be, as we had supposed, a lamprey, although very large for one. It was 3ft. 1in. in length and weighed exactly 3lb. We carried it home alive and had our opinion confirmed by one of the fishermen. He told us he had only known of one there before, and that had fastened by its sucker-mouth on to the rudder of his boat, from which position it was captured. I noticed that, when put into water and allowed to attach itself to a stone, it constantly spurted from a small blow-hole placed between its eyes. This I imagined to be the outlet from the bronchial apertures which would be made use of when the mouth was forming a vacuum on a stone. Does this fish differ from others in taking water into its gills and discharging it from the mouth and blowhole?

This year Mr Smart and Mr Bean, while fishing, captured another, rather smaller, within the week and within twenty yards of the same place. The spot is about three-quarters of a mile from the sea, and at the extreme limit of the normal tide. The lamprey we caught was wounded on the sides—possibly by a swan which cruises on the estuary. I might mention that it was thickly covered with a glutinous slime, which smelt of fish glue. I was sorry I had not anything at hand necessary to make a dissection, but, being away for a holiday, scalpels and forceps had been left behind.

Chislehurst. ERNEST W. HUTTON.

[The aperture between the eyes is the nasal opening through which the fish breathes.—ED.]

NOTES AND QUERIES ON NATURAL HISTORY.

COLIAS EDUSA IN SURREY.—I do not know if it is worth recording that on the 14th inst. I took a single specimen of *C. edusa* (a female) near Malden, but I believe it has not been seen in this neighbourhood for some years.—J. WAYHURST HEWAT (Savill Lodge, Surbiton). [We have heard of other captures having recently been made in Kent of both *Colias edusa* and *C. hyale*, which promises well for the species being plentiful in August and the autumn.—ED.]

A NON-EJECTING CUCKOO.—Under this heading I saw a note in the *Field* of June 2. That may interest the writer of it and others to know that the head gardener at Lamport Hall, Northants, informed me that a redbreast built in some ivy there and hatched a cuckoo's egg besides its own. The cuckoo, however, never ejected the young