of land and water; (3) changes in the position of the earth's axis; (4) a variation in the amount of heat radiated by the sun; and (5) various temperatures of those regions of space through which the solar system has moved. Discussing each of them, Mr. Wood deals at greater length with the theory advocated by Mr. Croll, arriving at the conclusion that, although the influence of geographical conditions and currents is a powerful agent in modifying climate, nevertheless the cause of the Glacial period must have been a coeval one; that the cold of this period seems to have fallen upon the earth while its axis was in its present position; and that nothing has yet been found to raise a doubt as to the glaciation of the northern and southern hemispheres having been synchronous. Mr. Wood confines it to show that it is rather strong at Inukituk.

Two shocks of earthquake were felt at Inukituk and its neighbourhood, on August 31 at 10 P.M., and on September 4 at 1.30 A.M. Both extended over a large region, and the last was rather strong at Inukituk.

Two earthquakes are reported as having occurred in Germany on October 14, the one near Kiel at 11 A.M., and the other at Schöpfheim between 8.30 and 9 P.M. The former extended over Strassburg, Kiel, Kork, Auerheim, Zierbolzen, Lichtenau, Linn, Dierstein, Rhein-Bischolshofen; the direction was apparently in a south-west-north-east direction. There were three or four shocks lasting about four seconds. The other earthquake was to the north of Schöpfheim, at Neuenweg and Griesgen, and was of shorter duration than the former; the direction was apparently north-south.

The African explorer, Eduard Mohr, writes to Dr. Nach- tigal, under date August 28, of his arrival at St. Paul de Loanda. Within eight days he was to proceed to Malange, on the eastern coast of Angola, which he was to make his base of operations for an employing journey to the northern interior.

In the Geological Section of the Helvetic Society of Sciences, held at Canton, many interesting smaller communications, the following have been reported:—The results of a thorough exploration of the western geological history of the Black Forest and of the Voges, by Prof. Sandberger; the results of explorations in the Argovian Jur, by Prof. Muller; the results of explorations by M. Meschin in the Bernese Alp, accompanied by a map of the mass of the Faistenau and of its neighbourhood; a map on the scale of 1:50,000 of the glacial deposits of Switzerland, with full particulars as to the former extension of glaciers, their depths, slopes, &c., made by Prof. Favez; and a very detailed map, on a scale of 1:50,000, of the glacier of the Rhone, with all its moraines, moraines, crevices, &c., constructed by M. Gossot, on the charge of the Swiss Alpine Club.

At the same meeting Prof. Sandberger presented his work "Land- und Süßwasser-Conchylien der Vorwelt." The terrestrial and fresh-water molluscs are described here in these geological successions, beginning from the oldest formations. Being very abundant in the Tertiary deposits, they have, as is known, much contributed to settle the classification of these deposits.

At the meetings of the Chester Society of Natural Science held last month, Mr. Gross exhibited some specimens of *Dracaea rotundifolia* which had been grown in Mr. Sikkil's farm cane, and which presented characters differing greatly from those of the typical plant. The axis had elongated considerably and bore a number of alternate leaves, quite green, with aborted tendrils, and several of them showing buds produced on the mid-rib. Some of the old leaves of the original plants placed in the case for preservation also exhibited the phenomenon last named.

We have received from Dr. C. A. MacMunn an account of the method he proposes for measuring and comparing different spectra with the spectrum microscope. In order to overcome the difficulties due to the difference in the dispersion of different prisms, he proposes to look upon the distance between the Fraunhofer lines 6 and 7 as equal to 10, and to express the position of all bands in relation to this scale. He, however, think that it is very desirable not to multiply the already too numerous arbitrary scales of this kind, and would strongly advise him and all others who are studying this subject, to express their results in terms of wave lengths, since, as Mr. Burch has argued, that system alone has a true physical basis.

The Bethnal Green Museum is becoming just now a great centre of attraction to the multitude from the numerous interesting collections illustrative of art and science now deposited together. The force speak to the eye for themselves, although the Secretary of the Department has taken care to provide admirable historical and descriptive cheap catalogues. But the scientific and industrial collections require more carefully prepared aids for study, and these are now being furnished by the Department in illustrated manuals, published at a cheap price, written by eminent authors, and on which no expense has been spared to make them thoroughly practical and useful treatises upon the subjects on which they treat. Messrs. Chapman and Hall, we are informed will publish immediately for the Council of Education and Department of Science, three of those works—"Food, its Chemical Constituents and Uses," by Mr. A. W. Chant, F.C.S., Professor at the Royal Agricultural College, Cherneke; "Economic Entomology," by Mr. Andrew Murray, F.R.S., and "Animal Products, their Preparation, Commerce, and Uses," by Mr. P. L. Simmons.

The additions to the Zoological Society's Gardens during the past week include a Cape Hyrax (Hyrax capensis) from South Africa, presented by Mr. J. M. Thornton; an Ocelot (Felis jardini) from Honduras, presented by Mr. H. Fielding; two Norwegian Lemmings (Lemmus lemmus) from Norway, presented by Mr. W. Lapela Crotch; a Common Hare (Lepus capensis) from South America, presented by Mr. J. T. Levet; an African Cobra (Naja haje) from South Africa, presented by the Rev. G. H. R. Fluck; a Ververt Monkey (Cercopithecus lasiurus) from South Africa, deposited; two Indian Cobras (Naja naja) from India, received in exchange; a Monkey (Hylobates larvarhodes), European, purchased.

**SEXUAL SELECTION IN RELATION TO MONKEYS**

In the discussion on Sexual Selection in my "Descent of Man," no case interested and perplexed me so much as the brightly-coloured hinder ends and adjoining parts of certain monkeys. As these parts are more brightly coloured in one sex than the other, and as they become more brilliant during the season of love, I concluded that the colours had been gained as a sexual attraction. I was well aware that I thus laid myself open to ridicule; though in fact it is not more surprising that a monkey should display his bright-red hinder and that a peacock should display his magnificent tail. I had, however, at that time no evidence of monkeys exhibiting this part of their bodies during their copulation; and such display in the case of birds affords the best evidence that the ornaments of the males are of service to them by attracting or exciting the females. I have lately
read an article by Joh. von Fischer, of Gotza, in Der Zoologische Garten, April 1876, on the expression of monkeys under various emotions, which is well worthy of study by any one interested in the natural history of these animals. I am not a careful and acute observer. In this article there is an account of the behaviour of a young male mandrill when he first beheld himself in a looking-glass, and it is added, that after a time he turned around and placed his rump against the glass, and that after all, nothing more happened.

Accordingly I wrote to Herr J. von Fischer to ask what he supposed was the meaning of this strange action, and he sent me two long letters full of new and curious information, which I have not time to publish here. I have only space to tell you that he says he was himself at first perplexed by the above action, and was thus led carefully to observe several individuals of various other species of monkeys, which he has long kept in his house. He finds that not only the mandrill (Cynopithecus niger) but the drill (C. latrans) and three other kinds of baboons (C. hamadryas, sphinx, and babuon), also Cynopithecus niger, Macacus rhusus, and Macacus nemestrinus, turn this part of their bodies, which in all these species is more or less brightly coloured, to him when they are pleased, and to other persons as a sort of greeting. He took pains to cure a Macacus rhusus, which he had kept five years, of the habit of making this manner before a looking-glass, and he found that the habit is apt to act in this manner, grinning at the same time, when first introduced to a new monkey, but often also to its old monkey friends; and after this mutual display they began to behave like old friends again. On the other hand, on being introduced to another monkey, or on being introduced to a new monkey, or in the same way, and to do so towards persons who were strangers to and new to monkeys. A young Cynopithecus niger may give the same indication.

In this way towards his master, but frequently towards strangers, and continues to do so until the present time. From these facts von Fischer concludes that the monkey, when beholding his image in this manner before a looking-glass, is as if the mandrill, drill, Cynopithecus niger, Macacus rhusus, and Macacus nemestrinus acted as if its reflection were a new acquaintance. The mandrill and drill, which have their hinder ends especially ornamented, display it even whilst quite young, more frequently and more ostentatiously than do the other kinds. Next in order come Cynopithecus hamadryas, whilst the other species act in this manner of their own accord. The individuals, however, of the same species, and in this respect, and which were very shy never displayed their hinder ends. It deserves especial attention that von Fischer has never seen any species purposely exhibit the hinder part of its body, if not at all coloured. This remark applies to many individuals of Macacus cynomolgus and Cercocebus radiatus (which is closely allied to M. rhusus), to three species of Cercopithecus and several American monkeys. The habit of turning the hinder ends as a greeting to an old friend or new acquaintance, which seems to us so odd, is not really more so than the habits of many savages, for instance of rubbing their bellies with their hands, or rubbing noses together, which the monkeys have not inherited, but are instinctive or inherited, as it was followed by very young animals; but it is modified or gained, like so many other instincts, by observation, for von Fischer says that they take pains to make their display fully, and it made before two observers, they turn to him who seems to pay the most attention.

With respect to the origin of the habit, von Fischer remarks that his monkeys like to have their naked hinder ends patted or stroked, and that they then grunt with pleasure. They often also turn this part of their bodies to other monkeys to have bits of dirt picked off, and so no doubt it would be with respect to the children of species of monkeys, and to extend to other animals, to retain the function of sexual feelings, for von Fischer watched through a glass door a female Cynopithecus niger and the two during several days, "undertake und dem Männchen mit giebiger Stimme den stark markirten Stützfläche serzige, was ich früher nie an diesem Thiere bemerkt hatte. Beim Anblick dieses Gegenstandes erregte sich das Männchen sichtlich, den es polterische Ketten auf den Steinen, ebenfalls giebiger Stimme und stupider betrieb, an welcher die hinder ends of their bodies more or less bright coloured live, according to von Fischer, in open rocky places, he thinks that these other monkeys can see each other. However they look at a man in the same way as to the other; as monkeys are such gregarious animals, I should have thought that there was no need for the sexes to recognise each other at a distance. It seems to me more probable that the bright colours, whether on the face or hinder end, or, as in the mandrill, on both, serve as a sexual ornament and attraction. Anyhow, as we now know that monkeys have the habit of turning their hinder ends towards other monkeys, it seems to be at all surprising that it should have been this part of the body which has been thus adorned, and that the reason why this was done, was that it is only the monkeys thus characterised which, as far as present known, act in this manner towards other monkeys, renders it doubtful whether the habit was first acquired for the purpose of ornament, and if so, whether the colouring and the habit of turning round were first acquired for the purpose of ornament, and that the habit of turning round was afterwards adopted as a sign of pleasure, or as a greeting, through the principle of inherited association. The principle apparently comes into play on many occasions; thus it is generally admitted that the songs of birds serve as an attraction during the mating season, and that the hawks, or great conglomerations of the black grouse, are connected with their courtship; but the habit of singing has been retained by some birds when they feel happy, for instance by the common Nightingale, which has been retained by the black grouse, during other seasons of the year.

I beg leave to refer to one other point in relation to sexual selection. It has been objected that this form of selection, as far as the ornaments of the males are concerned, implies that all the females within the same district must possess and exercise exactly the same taste. It should, however, be observed in the range of variation of the species of Cercopithecus, that although there may be a very large, it is by no means indefinite. I have elsewhere given a good instance of this fact in the pigeon, of which there are at least a hundred varieties differing in plumage, and at least a score of varieties of the fowl differing in the same manner; but the range of colour in these two species is extremely distinct. Therefore the females of natural species cannot have an unlimited scope for their taste. In the second place, I presume that no supporter of the principle of sexual selection believes that the females select particular points of beauty in the males; they are merely excited or attracted in a greater degree by one male than by another, and are not capable of depending, especially with birds, on brilliant colouring. Even man, excepting perhaps an artist, does not analyse the slight differences in the features of the woman whom he may admire, on which her beauty depends. The male mandrill has not only the hinder end of his body, but his face gorgeously coloured and marked with oblique ridges, a yellow beard, and other ornaments. We may infer from what we see of the variation of the ornaments of the mandrill were gradually acquired by one individual varying in a little in one way, and another individual in another way. The males which were the handsomest or the most attractive to any manner to the females would pair oftener, and would have rather more offspring than other males. The offspring of the former, although variously intercrossed, would either inherit the greater part of their father's beauty, and drill seems still to vary in the same manner. Consequently the whole body of males inhabiting the same country, would tend from the effects of constant intercrossing to become modified almost uniformly, but sometimes a little more in one character some in another, though at an extremely slow rate; all ultimately being thus rendered more attractive to the females. The process is like that which I have called unconscious selection by man, and of which I have given several instances. In one country the inhabitants value a fleet or light dog or horse, and in another country a heavier and more powerful one; in neither country is there any selection of the individual animals with lighter or stronger bodies and limbs; nevertheless after a considerable lapse of time the individuals are found to have been modified in the desired manner almost uniformly, though differently in each country. In two absolutely distinct countries inhabited by the same species, the individuals of which can never during long ages have intermarried and intercrossed, and where, moreover, the variations will probably not have been identical the same, the selection might still be decisive in driving the males to differ. Nor does the belief appear to me altogether fanciful that two sets of females, surrounded by a very different environment, would be apt to acquire somewhat different tastes with respect to form, sound, or odour, and that the males which pleased the one set of females, would have marked the third male as "Man" instances of closely-allied birds inhabiting distinct countries, of which the young and the females cannot be distinguished, while the adult males differ considerably, and this may be attributed with much probability to the action of sexual selection.

CHARLES DARWIN