body by forced breathing, and inhalation of oxygen just before holding the breath so as to prevent the system suffering from oxygen want. Neither of these two conditions would be influenced by doubling the atmospheric pressure, as a few deep breaths of nearly pure oxygen at normal pressure afford one much more oxygen than is needed by the body even during eight minutes.

If air is inhaled instead of oxygen, the duration of the apnoea is naturally increased with increase of the atmospheric pressure up to a certain point, as the total amount of oxygen thereby taken into the lungs, and rendered available for vital processes, rises proportionately to the pressure.

H. M. VERNON.

22 Norham Road, Oxford.

Moral Superiority among Birds.

Two letters have recently appeared in *NATURE* upon this subject, but they have mainly referred to the relative moral sense of different groups of birds.

It may be of interest to note the relationships existing between allied species. Amongst Corvidæ, the rook is gregarious, and breeds in rookeries. It always allows the starling (*Sturnidæ*) and the jackdaw to associate with it, and even to breed in the midst of the same social community as itself. Thus these birds are regarded as on an equality, or at worst as inoffensive satellites. A feasible explanation is found in the fact that all three are social species, and frequent human habitations.

On the contrary, the carrion crow lives at most in pairs, never collecting in a body to feed or to nest. It is a scavenger, a feeder on offal, in a word, an outcast. Compared with the work of the rook or that of the two birds just mentioned, so beneficial to the farmer the carrion crow's rôle is mean and degraded—though necessary. It is sly and cunning, and also addicted to purloining. Thus, compared with the rook, which is industrious and useful, and not usually sly, it exhibits a kind of moral inferiority. Very rarely does the rook suck the eggs of game or kill chicks, &c. (on which see *Shooting Times and British Sportsman*, July 18, 1908). Indeed, the moral inferiority of the carrion crow is proved by the rook's own attitude towards it. The latter will not allow the crow to invade its domains or to feed with it, and if any one of its own species turns to the evil habits of the crow it is ousted by general consent of the community.

The same demeanour is maintained in the relations between the rook and the magpie and jay.

Since psychic as well as morphic characters constitute the sum total of "specific" characters, the study of the moral sense in birds is important. In the animal world its very existence is perhaps best proved by experiment and comparison. Its neglect in biological work is a matter for regret. In the near future it must play an important part.

A. R. HORWOOD.

Leicester Corporation Museum, February 24.

The Dryness of Winter (1908-9).

THERE has been a good deal of surprised comment on the very dry character of this winter, but the season is apparently quite normal in this respect; that is, a very dry autumn tends to be followed by a dry winter. Here is a table showing the ten driest autumns at Greenwich from 1841 to 1907, and the rain-character of the winter following in each case:—

Ten driest Autumns	Rainfall inches	Rainfall following Winters inches	Relation to average (5'27)
(1) 1858 ...	2'80	3'36	—1'01
(2) 1890 ...	3'32	2'38	—2'89
(3) 1851 ...	3'33	5'05	—0'22
(4) 1884 ...	4'12	6'29	+1'02
(5) 1902 ...	4'18	5'00	—0'27
(6) 1897 ...	4'25	3'98	—1'29
(7) 1879 ...	4'54	3'27	—2'00
(8) 1901 ...	4'62	4'46	—0'81
(9) 1900 ...	4'71	3'91	—1'36
(10) 1904 ...	4'73	3'97	—1'30
Average ...	4'06	4'17	—1'10

NO. 2054, VOL. 80]

Thus in only one case (1884-5) was the winter rainfall in excess.

The autumn rainfall of 1908 (3.94 inches) would come between (3) and (4) of the above list.

The opposite tendency (with a very wet autumn) is also, I think, perceptible, though less pronounced.

ALEX. B. MACDOWALL.

Is there a Vertical Magnetic Force in a Cyclone?

THE discovery of a powerful magnetic force along the axis of a solar vortex will have suggested, no doubt, to others besides myself the possibility of a vertical magnetic force in a terrestrial cyclone. If such should exist, and the electrification of the air be positive, there would be a reduction in the magnitude of the vertical component of the earth's field in the northern hemisphere when the centre of the cyclone passes over the place of observation. As to the magnitude of the effect, an elementary calculation shows that the intensity of the force in C.G.S. units at the centre of a mass of air 100 miles in radius, revolving with a velocity of fifty miles per hour at that radial distance, would be less than $10^{10} \rho$, where ρ is the volume density of electrification in coulombs per cubic cm. Under ordinary atmospheric conditions ρ has been estimated as of the order 10^{-19} , although much larger values have been sometimes obtained, and the magnetic force consequently would be of the order 10^{-9} .

Unless the density of electrification is very large in cyclones, it is not likely that a magnetic effect would be observed. Perhaps a tropical cyclone of great velocity, in an exceptionally highly charged atmosphere, might leave a small trace of its passage on the vertical force record.

Rochdale, March 8.

J. R. ASHWORTH.

THE COAST OF THE CAUCASUS.¹

M. MARTEL'S description of his journey and observations in the Caucasus forms one of those tall octavo volumes, handsomely printed and superabundantly illustrated, which are published in Paris at about one-third of the price that would be thought necessary in London. It is the outcome of a voyage for geographical study undertaken in 1903 at the request of M. A. S. Yermoloff, Minister of Agriculture to the Russian Government. The war in the Far East has hitherto delayed the publication of the results, which now takes place in this agreeable form rather than in an official pamphlet.

Among the towns that are rising on the eastern shore of the Black Sea, with a view to the attraction of visitors to a new and romantic Riviera, are Sochi, the favourite of M. Yermoloff, and Gagri, the haunt of wealthy worldlings. Travellers in Russia will know how eager the rich are to get out of it in their weeks of leisure, and at Gagri since 1903 a pleasure station has been devised which may in time, within the limits of the empire, rival Biarritz or Monte Carlo. At present its richly oriental bazaar remains; in the fields behind the town the tombs of Mohammedan occupiers stand amid the lands they loved and tended; and even at the back of a sea-front of luxurious hotels there must always rise the castle wall built by Mithridates, the dark zone of forests, and the limestone plateau of Arabika, 8000 feet above the sea.

M. Martel's passage of the densely wooded ridges on the two flanks of the Arabika (pp. 172-87) supplied more adventure than is usual in a specially conducted tour, and this may have made him tolerant of civilised Gagri, then but a year old. But he is far more attracted towards Sochi, farther up the coast (p. 90), where isolated villas are to rise on the margins of wooded parks, and where even the Grand

¹ "La Côte d'Azur Russe (Riviera du Caucase)." By E. A. Martel. Pp. 358. (Paris: Ch. Delagrave, n.d.—actually 1908). Price 10 francs.