

you will in fairness allow me to take advantage, to prove that your article does scant justice to Mr. Stearns' predecessors in the application of the duplex system to long submarine cables, and that their success has been something more than "only partial" in the opinion of those who have employed their system.

Mr. Stearns' first success on a long cable dates from a few days ago. In February, 1876, Dr. Muirhead and myself obtained experimentally a perfect balance on the Suez-Aden cable, which, though shorter in miles, is electrically longer than either of the Anglo Company's cables from Valentia on which Mr. Stearns has worked.

In March of the same year Mr. J. Muirhead and myself duplexed the Marseilles-Malta cable, which, though only 825 miles in length, is worked by Sir W. Thomson's syphon recorder, and our system has been in commercial operation on the line ever since.

Early in 1877 Dr. Muirhead applied the system to the Aden-Bombay Cable, which is longer in miles and far longer electrically than either of the cables from Valentia, and since that time this line, as well as that from Suez to Aden, has been worked "duplex" whenever the traffic required it, to the entire satisfaction of the company.

Next, as to your remark that "Mr. Muirhead has been at work duplexing the Direct United States Cable with some prospect of success," the facts of the case are these:—

The cable, in its linear measurement, exceeds the longest Valentia cable by 543 miles; electrically it is twice as long.

It is worked with the mirror galvanometer, and not with the recorder, and these circumstances render the difficulty of obtaining a duplex balance upon it immensely greater than upon any of the other lines referred to.

Notwithstanding the difficulties mentioned, Dr. Muirhead and myself, in April last, obtained a perfectly satisfactory balance, enabling us to transmit sixteen words a minute in both directions at the same time, between Ireland and Nova Scotia, a cable distance of 2,420 nautical miles. HERBERT TAYLOR  
7, Pope's Head Alley, Lombard Street

P.S.—Since writing the above my attention has been called to NATURE, vol. xv. p. 180, containing an article on this subject, in which the applications of Muirhead's system to some of the cables referred to in my letter are spoken of as being the first practical successes in submarine duplex telegraphy.

#### Remarkable Colour-Variation in Lizards

MR. WALLACE's observations in NATURE, vol. xix. p. 4, on a black variety of the common lizard of Capri, as met with on the neighbouring islet of Faraglioni, induces me to refer to a similar appearance in the lizards frequenting the islet of Filfla, on the southern coast of Malta. As recorded in my book, "Notes of a Naturalist in the Nile Valley and Malta," p. 80, I have stated that during a visit to Filfla I was surprised to find that all the lizards on the rock were a beautiful bronze black and so much tamer than their timider brethren on the mainland. Many individuals were so tame that they scrambled about our feet and fed on the refuse of our luncheon. I subsequently sent specimens of this variety, or rather race, to Dr. Günther, F.R.S., who pronounced them identical with the *Podarcis muralis*, so extremely plentiful in Malta and Gozo. Now although the denizens of the two latter islands present divers shades of colouring, I never observed (and I looked carefully during several years) a black or dark-coloured individual. Filfla is about 600 yards in circumference and three miles distant from Malta. It is formed of the upper miocene limestone, and marks an important fault or down-throw which runs along the coast of Malta opposite, by which, as seen in the sketches Figs. 1 and 2 of the work referred to, it appears clear that the severance took place long subsequent to the days of the pigmy elephants, hippos, giant dormice and tortoises, whose remains have been found in such abundance in the crevices of the rocks opposite Filfla. There is no verdure on this bare rock-islet, the surface of which is dark-coloured, whilst its crevices shelter the lizards and furnish abodes for the nests of Manx and cereoneus shearwaters, whose docility at the breeding season is equally remarkable, both reptile and birds being like their compeers of Enoch Arden's island, "so wild that they were tame."

Probably the dark colouring is protective, and thus consorting well with the surrounding surfaces, would tend to preserve them

from the harriers, buzzards, and hawks which tarry in the Maltese Islands during the spring and autumn migrations

November 11

A. LEITH ADAMS

THE remarkable case of local colour-variation in lizards communicated by Mr. A. R. Wallace to NATURE (vol. xix. p. 4), had already been investigated by Dr. Theodor Eimer, an abstract or translation of whose memoir on the subject, entitled "*Lacerta muralis carulea*, a Contribution to the Darwinian Theory," is to be found in *Ann. and Mag. Nat. Hist.*, 1875, 4th ser., vol. xvi. p. 234.

J. WOOD-MASON

54, Claverton Street, S.W., November 16

#### The Drought

AT the present time, when more attention is paid to the influence of meteorological phenomena upon society, it would be useful to give some information as to the bearing of the local droughts and famines on our trade and the prospect of its revival. The China and Indian trades have not yet recovered. The droughts have also affected Egypt and Morocco. In the West Indies, Guiana, Venezuela, Colombia, and Brazil they are still operative.

They act to prevent the growth of produce, and in many countries, by reducing the water-ways, they impede its shipment. The people cannot consume our imports, the transit of which is in some cases impeded. The whole of these difficulties affects the exchanges and interferes with the money market and remittances.

The severity of the crisis is abating, but we can hardly feel assured of the revival of trade in Europe and the United States till there is a complete recovery over the vast areas of producing and consuming countries.

Thus the study of meteorological phenomena and facts acquires a new value for practical men and society at large, as stated by Prof. Jevons in your last number. HYDE CLARKE

#### Sewerage and Drainage

IN NATURE, vol. xix. p. 1, you touch upon a most important point in sanitary engineering which I have for ten years been striving by every means in my power to press upon the public, and I therefore venture to trouble you with a few lines on the subject.

The most important argument in favour of the exclusion of storm water from sewers consists, as you say, in the liability of road detritus to form deposits on the wide flat surface of any channels large enough to convey to one point an exceptionally heavy fall of rain over the area covered by a town, and the inevitably slow course of the infinitely smaller volume of sewage flowing or stagnating in dry weather along the same channels.

When separate sewers are provided for sewage they can be made of such smaller capacity as to keep up a constant flow from the houses in which the sewage is produced, to the land upon which it is to be purified, because the volume of liquid will very nearly correspond with the water supply, and the engineer has safe data upon which to adjust his means to the desired end.

In every town there are, or were, lines of natural watercourses, and if the scavengers' work is properly done the rain-water from roofs and streets may safely be discharged into any of these by short lengths of drains, less liable to be encumbered with deposits of road detritus, and with the certainty that if such accumulations should occur, they will be perfectly harmless from the absence of sewage.

The experiments of Mr. Way with London street water have been seized upon by Mr. Baldwin Latham in order to cover his retreat from the false position unfortunately taken up by himself and most of our senior engineers in the earlier days of sanitary science, and as he knows as well as any one else that it was a grand mistake to confuse and combine *sewerage* and *drainage* in one system, I agree with you in thinking it a pity that he has not acknowledged the facts more distinctly in the recent edition of his well-known work.

The greater proportion of the impurities detected by Prof. Way in the few samples of London street water which he tested are mineral ones which would be comparatively harmless, and, in the opinion of Dr. Voelcker, the experiments must have been vitiated by some mistake. Now as the latter authority has