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 cenerous shearwaters, whose docility at the breeding season is equally remarkable, both reptile and birds being like their companions 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

publicly stated this and added his opinion that no sanitary authority could possibly object to water from streets and roofs of houses, uncontaminated by sewage, being passed directly into any river, Mr. Baldwin Latham might have been expected to have investigated the subject further before adducing the one statement without the other.

There are many other arguments of a sanitary and economical nature in favour of the collection of sewage without more dilution than necessary with rain water, but I must not trespass further on your valuable space.

ALFRED S. JONES

Raysons du Crépuscule

My father tells me that he sees this phenomenon about five times in the year on the average in this climate. But the display at 4.40 this afternoon was unusually brilliant. The morning had been very wet, and when it cleared in W.N.W. at 2.30 we noticed the clear sky to be of an unusually green tint.

Very distant cirro-stratus on the south horizon ceased to be illumined by the rosy sunlight about twelve minutes before the phenomenon became visible. The latter consisted of very bright rosy rays, in a *very clear* sky, converging near the E.N.E. horizon, the moon shining very brightly on the left of the place of apparent convergence. The sky in interspaces between these rays was of a deep blue; these interspaces being, I suppose, the shadows thrown from distant cumuli and shower-clouds, some of which could be seen upon the western horizon.

Ashby Parva, Lutterworth, November 10 ANNIE LEY

The Power of Stupefying Spiders Possessed by Wasps

WITH reference to my letter on this subject (NATURE, vol. xviii. p. 695), Mr. Arthur Nicols writes me his disbelief that the pretended taking of the poison of snakes internally as a supposed antidote or prophylactic against the bite is anything more than a juggle of those chartered charlatans, the snake-charmers of India; or that it can be so taken with impunity. Of the wasps he says: "I dare say you know that one of the mason wasps of Australia glues its egg to the inside wall of the mud nest, and always at the top, while the rest of the space is filled with spiders. The sting of this wasp is a terrible affair. I was rendered quite comatose for several hours by being stung in the knee" [which, by the way, is precisely the condition of the spiders], "and the pain was most excruciating, with aching and swelling of the inguinal and axillary glands. I don't know whether the wasp stings the spiders, but they are always in a good state of preservation, even when the egg is on the point of hatching. I never found one in the least decomposed. The nest, however, is hermetically sealed, and decomposition could hardly take place, because so very small a quantity of oxygen is inclosed within." It will be remembered that Mr. Armit remarked "a constant movement in the legs of the spiders," and that observation has been made before.

If the word "wasps" in the above heading (which is not mine) be understood to refer to any of the true vespæ (*vulgaris*, *rufa*, *britannica*, or *borealis*), I agree with Mr. Frederick Smith (NATURE, vol. xix. p. 32), that it is misleading. But the solitary insects whose habits have been referred to, have been called wasps in all the popular books of natural history with which I am acquainted; and the correctness, or incorrectness, of the English name does not affect the points brought forward. I may, perhaps, be allowed to recall that the one object for which I referred to the Athenian insect—in connection with a correspondence then going on in your columns as to the senses of insects—was the remarkable circumstance that it seems to hunt down its prey *by scent*. Mr. Armit, of Queensland, referring to that letter, asks the further question: How are the spiders stupefied, and not killed, by a sting, formidable enough in one species to endanger the life of a man? Mr. Smith's letter throws no light on either of these points.

Bregner Bournemouth

HENRY CECIL

The Ayrshire Crannog

THE remarks made by Dr. Buchanan White in your last issue in regard to the supposed existence of beech and the absence of Scotch-fir in the Ayrshire Crannog will be carefully attended to. Birch and hazel, so easily recognised by the bark, are certainly in greater abundance than any other kind of wood.

I shall, however, collect as many specimens as I can find and submit them to the examination of competent authorities and publish the result in due course. We have now made a large addition to our list of relics, among which I may mention the following:—three daggers (one of which has a gold band round the handle); one knife, one gouge—all these are made of metal, of which the gouge alone has been tested and found to be bronze; a polished stone celt; a clay spindle whorl partially perforated; a curious fringe-like object made of vegetable material; several implements of bone and deers'-horn; a piece of wood with carving on it; portions of a flat dish cut out of wood; a wooden scraper cut out of a trunk of a tree with the handle formed of a branch growing straight out from it—(beside this scrape about a handful of short black hair was found);—a double paddle of a canoe together with various other wooden implements. Hitherto not a single fragment of any kind of pottery has been found on the Craunog. Being merely an amateur in this kind of research, I shall be glad to receive any suggestions from experienced gentlemen as to important points that should be looked after.

ROBERT MUNRO

Kilmarnock, November 16

ON THE UTILISATION OF THE AFRICAN ELEPHANT

THE *Colonies and India*, of November 2, contains a short but suggestive article under the heading "Notes," "Elephants in Cape Colony," which deserves consideration. It states that elephants are numerous in the interior of Cape Colony as well as in Central Africa, yet no one seems to have attempted to catch and tame them. The subject has already been mooted that there is a good field for their use both in Central Africa and in Cape Colony, and that they would prove a new and important method of opening up and utilising the wealth of the Colony and of furthering the explorations in Central Africa, which are now of such general interest.

It appears that a troop of wild elephants has been observed within fifty miles of Port Elizabeth—on these the attempt might first be made—and it is well known that they abound in Central Africa, where, indiscriminately slaughtered for the sake of their ivory, the destruction of these animals is so great, as at no very distant period to threaten their extinction. It seems worthy of consideration whether it would not be better to attempt to utilise them as beasts of burden, as is done in India, where they are of inestimable service to the Commissariat, the Public Works Department, the planters, and many others. The African differs from the Asiatic elephant in some points, but is equally well adapted for labour, and, there can be no doubt, would be as easily tamed and trained as his Indian congener. That this is the case is amply proved by the docile and submissive state into which the male and female African elephants now in the Regent's Park Gardens have been brought by Mr. Bartlett and their keeper, Scott. They appear to be just as obedient, intelligent, and free from vice as Indian elephants, and there is, I think, little doubt that the one species, under proper training and discipline, would be as useful in Africa as the other is in India.

There is every reason now to hope that the wealth and resources of our South African possessions will undergo development—might it not be well to revive the suggestion that the elephant should be enlisted in the good work? The importation of one or more of the numerous officers who have been trained to the work of catching and domesticating wild elephants in India with a fitting establishment, and, perhaps, a few Indian elephants to commence the work, would very soon put the value of the undertaking to the test, and probably show that a vast source of working power now unused might be made available.

It is probable that in ancient times the African elephant was domesticated, and any one who has studied the two magnificent specimens in the Society's collection in