gradients. (2) On the nearness of the observer to the path of the cyclone centre. (3) On the velocity of translation of that centre.

In a great many cases I have observed, especially in the west of Ireland, that when a rapid fall of the barometer is reported, the wind is much stronger than existing gradients would *seem* to justify.

From this it would seem than the rate at which the change of pressures is taking place has some influence on the strength of the wind.

3. Prof. Loomis has shown in his examination of the U.S. Weather Charts that in American cyclones the area of rain-cloud extends further in front when these storms are going fast than when they are going slow.

From this it would appear that another element of intensity besides wind, viz., precipitation, is increased when a cyclone centre moves with great rapidity.

It was mainly on these grounds that I based the statement in my former letter. RALPH ABERCROMBY

21, Chapel Street, Belgrave Square, October 5

Deltocyathus Italicus, Ed. and H.

I FIND that Prof. Ralph Tate, F.G.S., President of the Adelaide Philosophical Society, has lately written as follows in an anniversary address. "On the other hand the Geelong coral, *Deltocyathus italicus*, Ed. and H., better known from the Italian Miocenes, is considered by Count Pourtales and Sir Wyville Thomson to be specifically distinct from its living analogue inhabiting the deep waters of Florida—an opposite opinion to that held by Prof. Duncan." During the last conversation I had with the late M. de Pourtales he informed me that after having seen and studied the Italian types, he was satisfied that I was correct in the statement I had made regarding the specific identity of the Tertiary and recent forms.

P. MARTIN DUNCAN

4, St. George's Terrace, Regent's Park, N.W.

Temperature of the Breath

MY attention has been directed to a communication under the above heading by R. E. Dudgeon, in NATURE, vol. xxii. p. 241. The speculations therein raised regarding the temperature of the breath are scarcely compatible with ascertained physiological truth. Mr. Dudgeon's friend's explanation, against which he argues, is undoubtedly correct. The great value of woollen clothing in preventing chill after exercise may be explained on the same principles. The hygroscopic state of the atmosphere (and material) is the condition which causes variation in different experiments. Different materials have effects corresponding to their hygroscopic properties. The following results of a few experiments which I recently made speak for themselves :—

No. 1.—Temp. of air, 87° F.—Air moderately dry (dew point not ascertained).
,, breath, 96° in mouth cavity.
,, ,, 102°·9.—Thermometer enveloped in four folds wool.
,, ,, 102°·2.—Thermometer enveloped in four folds silk.
,, ,, 100°·8.—Thermometer enveloped in four folds linen.

No. 2.—Temp. of air, 79° F.—Air very damp, raining heavily.
,, breath, 97° in mouth cavity.
,, ,, 99° ,, through four folds of silk.

Time occupied in each observation, three minutes.

Madras, September 9 C. J. MCNALLY

Swiss Châlets

I DO not know whether the idea has previously occurred to any one that the modern Swiss châlet is a descendant of the old lake dwelling, but I was strongly impressed with that conviction this autumn. Not only do they actually build the smaller châlets, used as storehouses, entirely on short piles, but very many of the dwelling-houses are still one half on piles, the steps leading up to the gallery passing through a hole in the middle, so that the modern exterior gallery would represent the original platform. In the lake dwelling the probability is (I would suggest) that there was a trap-door in the centre of the platform, inside the inhabited part, with a movable ladder, so that the latter could be drawn up and the trap-door closed if required. At the present day the ladder is represented by fixed wooden or stone steps leading up into the gallery. The house being now on land, the lower part is half or entirely closed in, and so forms an extra chamber, though the family still dwell above the platform (*i.e.* the gallery) as in days of yore. GEORGE HENSLOW

Fascination

FASCINATION originally meant a supposed power in man and snakes of controlling or arresting the movements of various animals by a glance. Your correspondent M. Chatel's personal anecdote, with his comment thereon, suggests that the snake in some way mesmerises his victim, not by its glance but by its movements. His supposition that "the rapid gyratory motion of a shining object" leads on to the debilitating nervous attack, is open to debate. In displays of fireworks such motion occurs before crowds without making any one sick or frightened or inclined to rush into the middle of a catharine-wheel. However then the motions of the snake, whether swift or slow, may avail in attracting and fixing attention, the final catastrophe is probably due to pure fright, according to the old saying, *Multis ipsum metuisse nocet*. We may safely infer that your correspondent himself would have felt no squeezing round his temples had he known at first that the snake was for him a harmless one, and not a viper nearly five feet long!

In the opening letter on this subject the basilisk and the bombshell seemed to be endowed alike with a semi-miraculous power of enchaining the victims that looked upon them. Now, that small birds should be paralysed with terror at the sight of a gesticulating snake is possible or probable enough; but that English officers should be rooted to the ground by mere alarm at the flight of shot or shell is an uncongenial explanation of facts which appear to me capable of interpretation on a different hypothesis.

In moral, as distinct from physical, perils, there is good reason to suppose that too close a concentration of thought upon a danger has a tendency to overpower the will and bend it to the commission of the very acts which the intellect has pronounced unchoiceworthy. But the acts so committed carry with them present gratification. To use the common simile, men fly to them as moths to a candle, not because they are panic-stricken, but because the sense of the danger is lost in the pleasure that attends it.

I am inclined, in the present state of the controversy, to group the effects of so-called fascination under three heads: (1) there is the effect of paralysing terror; (2) there is the effect of indecision; (3) there is the effect of qualities attractive and repulsive accidentally combined in the same object. The first and second effects are perhaps at times combined together in various degrees, and mixed with that absorbing curiosity of which Mr. Hodgson speaks (NATURE, vol. xxii. p. 383), but which by itself seems rather to deserve the name of abstraction than of fascination.

As to fascination in the original sense of the word, its nature may await discussion till observation proves that such a power in reality exists. THOMAS R. R. STEBBING

Tunbridge Wells, September 27

Air-Bladder of Herring

IN NATURE, vol. xxii. p. 520, there was an abstract of Mr. F. W. Bennett's paper on the "Visceral Anatomy of the Herring" (*Journ. Anat. and Phys.*, July 1880). It has escaped the notice of Mr. Bennett that Dr. E. H. Weber described and figured (Tab. vii. 63) the posterior opening of the air-bladder of *C. harengus* into the urogenital sinus in his "De Aure et Auditu Hominis et Animalium," pars i. 1820.

Zoological Museum, Cambridge ALFRED C. HADDON

The "Waiting Carriage"

M. HANREZ' proposed "waiting carriage" (NATURE, xxii. 519) has doubtless been schemed by many readers before now. A simpler form had long ago occurred to me, having the drum of cable in the *train* engine, the cable passing under the carriages and catching the waiting carriage at the tail. The running out of rope could be as well managed at one end of the train as at the other, and only an ordinary carriage without any special engine would be required, which would be dropped just before picking up another at the next station, each carriage thus slowly shifting round the line.

But any such plan would entail a fresh build of carriages; and for discontinuous carriages a plan nearly as good would be to run a railway omnibus on the rails, with a small 6 or 8 h.p. engine all in one. This would be stopped anywhere between stations, at crossings, farmhouses, and hamlets along the line, and would serve the peasantry for going shopping, beside taking up baskets of garden produce. Passengers going a long journey would change at a main station and join the ordinary train, which would only stop about every hour at the ends of forty or fifty miles' stages. Country lines only running a train every two hours or so would be easily worked thus, the 'bus being shunted by telegraph if necessary, and the line signalled clear as usual. With double lines the 'bus would run on the goods line.

Bromley, Kent W. M. F. PETRIE

A NEW KIND OF ELECTRIC REPULSION[1]

DR. GOLDSTEIN has devoted a good part of the last ten years to an investigation of the discharge of electricity through gases, and amongst the many phenomena which he has brought to light, the one described in a memoir published in a separate form is not the least interesting and important. The facts may be stated in a few words: *A negative electrode exerts a strong repulsion on the rays of the glow proceeding from itself or from another negative electrode.* Before describing the experiments proving this statement, and the laws by which this phenomenon is regulated, we shall follow Dr. Goldstein in reminding the reader of a few facts connected with a discharge of electricity through gases which he will have to bear in mind.

It is well known that the negative electrode in a gas, for which Faraday's name of cathode may be conveniently used, is surrounded with a glow which expands as the pressure of the gas is reduced. We are able to distinguish four layers in this gas, though three of them only are easily recognised. As a first approximation we may assume the outline of these layers to be parallel to the outline of the electrode, though, as we shall have to mention, Dr. Goldstein has shown that this is not strictly correct.

The layer of the negative glow adjacent to the cathode is luminous, and shines in air with a yellowish-red tint. This first layer is surrounded by a second layer, which is very little luminous. This is the dark space mentioned by Mr. Crookes; but, as Dr. Goldstein shows, it is not entirely dark, but has in air a bluish tint. We next come to the third and fourth layers, which may very well be taken as one, and which are more generally designated by means of the term, negative glow. They form the outer boundary of the luminosity surrounding the cathode. If the pressure of the gas is sufficiently reduced to enable the glow to touch the glass, it becomes phosphorescent, and only the layer of the gas immediately touching the glass causes the phosphorescence. The phosphorescence gets stronger as exhaustion proceeds; at the same time the luminosity of the glow gets weaker. The appearance and extension of the glow does not depend on the position of the anode, while the luminous positive discharge varies very much with the relative position of the electrodes, and can be made to disappear altogether by bringing the electrodes sufficiently near.

Already Plücker, and especially Hittorf, have come to the conclusion that the negative glow is propagated in rectilinear rays from the cathode, and it can further be shown that the direction of propagation is generally in a direction nearly normal to the surface of the cathode. Dr. Goldstein draws a distinction between such elements of the cathode which lie near the edge, if the surface of the cathode has edges, and elements which are removed from the edge. While those elements not near an edge only send out rays within a cone of narrow aperture in a normal direction, the edges send out rays in all directions. This difference in the behaviour of different elements of the same surface is, it appears to us, well explained by Dr. Goldstein's discovery of a repulsion between the electrode and a ray proceeding from the cathode. A little consideration will show that this repulsion will, whenever cylindrical or plane electrodes are used, be in a nearly normal direction for any part of the surface which is sufficiently removed from the edge, while near the edge the resultant repulsion will be away from the surface and from the greater angle with the normal the nearer the ray is to the edge. This would prove of course that the repulsion is not an electrostatic one, for in that case it would always be at right angles to the surface. If the exhaustion is such that the glass becomes phosphorescent, the phosphorescence, being produced by the rays proceeding from the cathode, it is clear, will form a luminous ribbon surrounding the electrode, which is a little larger than the electrode.

If now a solid body is introduced between the cathode and the glass inclosure, a shadow of this body will appear in the phosphorescent light on the glass; the formation of the shadow is a direct consequence of the rectilinear propagation of the rays.

We now proceed to describe Dr. Goldstein's experiment in its simplest form.

In a cylindrical vessel two parallel electrodes of equal length are introduced at one end, while the other end contains a third electrode which shall always form the anode. Let the pressure be such that phosphorescence appears, and let only one of the two parallel electrodes be connected with the negative pole of the coil, while the other is insulated. A shadow of this insulated wire is seen in the phosphorescent light on the glass. Now let the insulated wire be brought into metallic contact with the other electrode, and the whole appearance will change. In the phosphorescent light of the glass we shall see two dark surfaces of equal size and shape, and with distinctly marked edges. The two dark surfaces are situated in such a way that a plane which passes through the electrodes cuts them into two equal halves. They are partly bounded by straight lines, partly by two semicircular arcs.

The parts formed by straight lines are parallel to the electrodes, and of equal length; these straight lines are joined at the lower end, that is, at the free end of the electrodes, by means of a half circle, which is partially repeated at the upper end; but where the electrodes are sealed into the glass the curve is interrupted. The dark surfaces are bordered by a bright line of light. It will facilitate the understanding of the position and shape of these dark surfaces if we mention already here that they are such as would be produced if the rays emanating from each electrode, and propagated in a normal direction from it, suffer a repulsion and consequent deflection in the neighbourhood of the other electrode, so that the dark space is formed by the absence of the phosphorescent light which would be produced by the rays coming from the farther cathode.

We cannot here give the further description of shape and the measurement of the size of these dark surfaces, but at once describe their properties. In the first place the size and shape are altogether independent of the position, form, and size of the positive electrode. The relative position of the two cathodes, on the other hand, materially affects their behaviour; and Dr. Goldstein gives their shape, for instance, if, instead of being parallel, they are at right angles to each other, either in the same plane or one in front of the other. We have already stated that in the case of parallel electrodes the parts of the outline forming straight lines are of equal length with the electrodes, and hence the length of these dark surfaces increases with the length of the electrodes, but the breadth and half-circle joining the straight lines

[1] "A New Kind of Electric Repulsion," by Dr. E. Goldstein. (Berlin: Julius Springer, 1880.)