

must employ α, β, γ , as defined in Mr. Watson's letter in your issue of January 27 (p. 296). These mechanical forces cannot, I believe, be expressed in terms of the values of a, b, c, u, v, w , and their differential coefficients at the point. This is a definite physical argument in favour of the existence of α, β, γ , within a magnet.

St. Moritz, Engadine

JAMES C. MCCONNELL

"Phantasms of the Living"

NOTHING in your last week's notice of "Phantasms of the Living" gratified me more than the attention paid to our experimental results. The grounds of our own confidence in them are (1) that the conditions were in many cases such as completely to exclude unconscious physical signs, and (2) that, if the success was due to fraud, it was not fraud which the investigators failed to detect, but fraud in which they must actively have shared. But, where the scientific presumption against new phenomena is so strong, it is best to recognise that no line can be drawn at which the evidence for them *ought* to be found convincing, and that, till it actually *is* found convincing, it is incomplete. Meanwhile it *ought* to be sceptically approached—not with the impatient scepticism which denies that such facts can ever be proved, but with the cautious scepticism which perceives that they require a very great deal of proving. The object of this letter, then, is to urge the paramount importance of extending the area of experiment. This cannot be done without an amount of public spirit which it is very hard to evoke. The "percipient" faculty, even though possessed in a high degree, is very unlikely to reveal itself spontaneously: our only hope of discovering it is that trials in thought-transference shall be very widely made—which means that a large number of persons shall spend some time and trouble in a manner which will often appear to have been fruitless. It is difficult to press this on anyone as a duty; but it is at any rate worth while to point out how simple and rapid the process of experimentation may be made. Especially anxious am I that a great many pairs of persons should carry out experiments of the very simple type described in "Phantasms," vol. i. pp. 32, 33. If any of your readers are willing to do this, will they kindly, *before beginning*, send me their names and the number of the trials that they propose to make, to guard against any selection of results?

EDMUND GURNEY

14 Dean's Yard, S.W., February 3

University College, Bristol

MY attention has been called to a paragraph in your issue of the 3rd inst. (p. 326), referring to this College. Will you kindly grant me space to correct the statement made therein, which is inaccurate in some important points, and is calculated, as it stands, to injure our reputation?

No general reduction of the salaries of the Professors has been made, nor is it contemplated. Notice to terminate our engagement with two Professors has been given them, as it was believed that more advantageous arrangements could be made in their departments without affecting the quality of the instruction given. It is too true that the College greatly needs more liberal pecuniary support than it has hitherto received, but efforts are being made to procure it; and as yet the Council have no intention of limiting the subjects hitherto taught, or of requiring a lower standard of attainment than that which has distinguished so many of their Professors.

ALBERT FRY,

Chairman of the Council

University College, Bristol, February 7

A Rule for escaping a Danger

SUPPOSE a weir, AB, across a river, and first let it be at right angles to the direction of the current. Suppose a man in the stream above the weir, nearer to B than to A. Let O be his position, and OX a perpendicular on AB. Then he cannot

BX

escape if his velocity, v , is $< \frac{OB}{OX} \cdot u$, where u is that of the

OB

stream. If his full speed has this critical value, or if there is any uncertainty about his safety, he must swim at right angles to OB.

The rule is obviously correct, for to escape he must clear the nearer end of the weir, and must therefore exert his strength in the direction mentioned. Geometry puts it clearly: Reduce the stream to rest so that the weir is advancing on the man with

velocity u . Let P be the point at which the man is overtaken, then, if PN be perpendicular to AB,

$$\frac{OP}{v} = \frac{PN}{u},$$

so that P is on a conic for any given velocity. Varying v , he will escape if the conic reaches the bank. The first to do so touches at the end C of the minor axis, and since CB is a tangent, the angle COB is right. Also now

$$v : u = OC : CB = BX : OB.$$

If the weir slants across the river, the direction of safety is still at right angles to the line joining O to A or B. The swimmer must decide, by looking in both directions, to which bank to direct his efforts. The locus of points for which both directions give the same distance is, to axes through the middle of the weir up and at right angles to the current, of the form

$$(y^2x - 2aby + b^2x)(y^2a - 2bxy + ab^2) = by(x^2 - a^2)^2,$$

a quintic having cusps at A, B.

The rule fails if the change of velocity as one approaches the bank be considerable. One would then strike more across.

If one were being charged by any insensate object, the rule would of course apply.

FRANK MORLEY

Bath College

Abnormal Cats' Paws

IN reference to the recent articles in NATURE on six-toed cats, allow me to remark that the experiment about to be tried on one of the small islands off the English coast has *apparently* been anticipated at the village of Morrishes Centre, on Long Island, where nearly all the cats have at least one supernumerary digit on all feet, and are currently called, in the place, "double-footed." I have a specimen showing the abnormality distinctly. I say "apparently," because there can be little doubt that at some time a single individual was introduced, which has become the ancestor of all the "six-toed" cats in the village.

E. W. CLAYPOLE

ABNORMITIES in cats' paws occur rather frequently in Massachusetts. They are called mitten cats, and are much in demand because they are considered to be good mousers. The first I ever saw was a male yellow tiger, whose four paws had two extra toes strongly developed. A little stray female kitten which was brought up at my house had two abnormal fore-paws with four extra toes on each. As there are no male cats in our neighbourhood with any abnormality I was very anxious to see whether her young ones would inherit the shape of their paws from the father or mother cat, and whether some abnormality would also appear in the hind-paws. She had eight, and only one of them with four normal paws; all the others inherited from the mother the abnormal fore-paws, some even having five to seven extra toes, with perfectly developed claws and pads. I did not pay attention to the sex, but brought one up on account of its strong build, which turned out to be a male, and another for its beautiful stripes, which was a female. The old cat rested nearly a year, and then again had eight three times in succession, in April, June, and October, and every time only one with normal paws. The mother is a pale grey tiger, and each one of the young ones was differently spotted, and, as I believe, had a different father, as I recognised the marked resemblance to the various visitors to our garden. I paid no attention to the sex, but brought up from the last litter the strongest looking, which turned out to be a male, and two others—the one selected by a child, the other because it had seven extra toes. Both these were females.

H. A. HAGEN

Harvard University, Cambridge, Massachusetts, January 5

The Cross as a Sun Symbol

THE use of the cross as a sacred symbol dates from the earliest times, and is almost universal. It occurs upon the monuments and utensils of every primitive people from China to Yucatan. In many, perhaps in a majority of, instances it is used as a symbol of the sun. One of the oldest and most widely occurring forms is the cross with *crampons* turned to the right or left, the *svastika* and *sauvastika* of India, the "Thor's hammer" of Western Europe. Prof. Max Müller thinks that the *svastika* represents the vernal sun, and is hence an emblem of life,