

lays the foundation of what becomes habitual or instinctive. In man, unconscious thought becoming habitual, it is the nursery again of conscious thought, the two conditions in the adult coexisting.

Turning to comparative psychology, a branch which has always appeared to me of particular importance, we find in intelligent animals, as the dog, either in community (commonly called wild) or in the domesticated state, the same nature of mind as in man and the like manifestations. In the young animal, however, there must have been the same precedent stage, though the conscious stage is of course produced earlier than in man.

This raises the question, on which we can speculate, but which we cannot as yet solve, whether some animals are not mostly in the state of unconscious thought, never attaining to that of conscious thought. Looking to the cases of degradation in man, it appears to me that in softening of the brain the man falls back to the unconscious stage, and in some instances remains for some time in it, so that here we get an example of prolongation, it may be called continuance, of the unconscious stage.

Such a state as that of habitual unconscious thought may be regarded as possible and probable, and we are justified in applying it to many animals of inferior nervous organisation. The condition of consciousness being absent, the degree of pain is less, as must be the case in infants. So far from the saying of the master painter of mankind being true that the worm feels as great a pang as when the giant dies, the worm must be less sensitive and less sensible. It is quite possible that the antivivisectionists may be in the wrong as to lower animals, whatever reason they may have as to those like the dog.

There will be at least the like gradations of mind as of form in the animal world, and the difference between an animalcule and a dog will be enormous, and still greater that between the animalcule and man. In the higher stages the differences will be vastly augmented by the agencies at work. Thus it must be that the conscious stage producing precision of action influences the habitual condition of the unconscious stage. Having applied this to man, we may better conceive it, and form some notion of its prodigious relative development by considering how man so constituted has his power of thought enhanced by the great instrument of speech.

These causes contribute to the great differences which I long since pointed out between the rapidity of thought of one man and another, or of the same man at different times of life or under various conditions. My paper "On the Geographical Distribution of Intellectual Faculties in England," following one at the British Association, being published in the *Journal* of the Statistical Society (June, 1871, p. 357), has escaped the notice of psychologists and physiologists, being esteemed statistical, whereas it is also psychological. At p. 357 I gave an account of an experiment, showing a fluctuation in conscious thought in one adult of from 1 to 4, or 100 to 400, denoting an enormous difference, and illustrative of the variations in mental power which exist in society. If, however, we were to estimate a child of 14 at 50, then the ratio would be as 1 to 8. If we take a child of 7 at the quarter of an adult, then we should have 1 to 16. These are not extreme measures, for in the babe we may find 1 to 100, 1 to 200, 1 to 400.

This is given as an illustration of what must exist in the animal world as to conscious thought, and that without reference to unconscious thought, which must be the condition of many classes. Physiologically the subject has been treated by many physiologists, and notably most admirably by Dr. Carpenter; but here the psychological aspect in the special forms indicated is alone brought into prominence.

The phenomena of unconscious thought, indeed, require much greater attention. Not only do they underlie the distinctions between animals and between animals and man, but they must be taken into consideration as explanatory of dreams and of many forms of mental disease. This has been partly dealt with by Dr. Carpenter.

While the later steps of dreams, the visible and pictorial stages, are greatly under the influence of conscious thought, the early stages are under the influence of unconscious thought. It appears to me quite possible that unconscious thought is not altogether latent in sleep. It is worthy of consideration what is the condition of a wakeful animal, say a dog—whether it is one succession of dreams or a form like delirium.

The recurrence of an error once implanted in the mind, notwithstanding our efforts to eliminate or counteract it, is probably

due to the tenacious resistance of unconscious thought, storing up and reproducing the error.

Heredity of thought, whether as dealt with by Mr. Francis Galton or by myself in the paper quoted at p. 359, &c., may be assigned chiefly to the transmission of the habits of unconscious thought, if we consider more especially the condition of the lower animals.

As my last communication was mentioned in the *Daily Telegraph* of November 29, and with the assertion that Dr. Carpenter, Mr. C. T. Munro, and myself have provided in unconscious thought a new plea for unaccountability for criminal actions, it is well to remark that the phenomena discussed have no such bearing.

HYDE CLARKE

December 20, 1879

Stags' Horns

THE disappearance of the antlers of stags, in the Highlands and elsewhere, is to be accounted for by the fact that they are saleable articles; but although they do not assist as *entremets* at the animal's meal it may happen that they assist—in the form of knife-handles—in the distribution of his venison at our dinners.

When a lad I obtained many antlers of the Fallow Deer from a neighbouring park, the tines of which were sometimes broken but never gnawed or polished by licking.

It would scarcely be surprising that deer should crave for calcareous matter during the rapid development of their antlers, but neither are their tongues adapted for rasping nor their teeth for comminuting hard bones.

PAUL HENRY STOKOE

Beddington Park

No gillie that I know of has the honour of my acquaintance, and therefore no gillie can know, save indirectly, that I have picked up a horn of the red deer, in a park near Sheffield! I was told at the time by the gardener who accompanied me that these horns were eagerly sought after by the Sheffield knife-makers for the purpose of making bucks' horn knife-handles.

M. T. M.

A Query

I HAVE seen somewhere (but I am unable to say where) a statement to the effect that there is some evidence for the supposition that in the crystallising state of matter the forces between molecule and molecule are not directed in the right lines joining the molecules. Can any of your readers throw light on this subject, or give references to sources of information about any other case in which the mutual action of two molecules is not directed in the line joining them?

IGNORAMUS

THE ASSERTED ARTIFICIAL PRODUCTION OF THE DIAMOND

PROF. MASKELYNE sends us the following letter on this subject:—

I should be obliged if you would accord me space in one of your columns in order that I may answer a great number of letters and applications which have pursued me during the past few days on a subject of some little public interest, that subject being the asserted formation of diamonds by a gentleman at Glasgow.

Some ten days ago I had heard nothing whatever of the claim of Mr. Mactear, of the St. Rollox Works, Glasgow, to the artificial production of the diamond.

My name, however, was already in several newspapers as that of a person in whose hands the asserted diamonds had been placed for a decision as to their true nature. Ultimately a small watch-glass with a few microscopic crystalline particles came into my hands for this purpose from Mr. Warrington Smyth, and subsequently a supply came to me direct from Mr. Mactear. I shall proceed to state the results I have obtained from the examination of these.

Out of the first supply I selected by far the largest particle, one about the $\frac{1}{60}$ th of an inch in length, and it may be that I wasted some time in experimenting on this particle, as it might not have been an authentic example