

LETTERS TO THE EDITOR.

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Compulsory Greek at Cambridge.

My own experiences are somewhat different from those of your correspondents, but the result is the same. I commenced Greek when about thirteen; I passed the London matriculation, the entrance examination at Trinity, and the Little-go without any difficulty; and I have read the three synoptic gospels in the original, several Greek plays and a certain amount of Homer, Xenophon, and Thucydides. Now, if all the knowledge I thus acquired had been of any practical value to me in after life, I should, as a matter of ordinary common sense and worldly wisdom, have kept it up; but, finding Greek absolutely useless, my acquaintance with the language has so completely faded away that I can scarcely make out the sense of a Greek quotation in a historical or theological work.

It has often been a matter of profound regret to me that the time spent on Greek was not devoted to German, for if it had I should have been able to speak the language sufficiently well to enjoy during my whole life German society, German literature, and German places of amusement.

I have never been able to discover any educational value in a training which condemns boys to grind up pages of Greek declensions and irregular verbs. In my experience of life a youth who, after acquiring some knowledge of the grammar of a modern language, is made to read easy books on the manners, customs, and history of the country where the language is spoken (and nothing is better than a well-written novel) is far better equipped for the battle of life, and is a far more agreeable companion both intellectually and socially, than a man whose boyhood has been spent in studying musty old mythologies, which nobody troubles about nowadays except the select few who have made such subjects the hobby of their lives.

By all means let the bishops continue to require a knowledge of Greek (and also of Hebrew) on the part of candidates for orders, on the ground that these subjects ought to be considered part of the professional stock-in-trade of a clergyman; but special studies of this kind, like law in the case of barristers and solicitors, need not be commenced until a youth has decided upon the profession he intends to follow.

A. B. BASSET.

January 27

Can Birds Smell?

EXAMINATION of the Bird's brain shows that the sense of smell can be but little developed. The olfactory bulbs are small. No medullated nerve-fibres unite them with the rest of the brain. Yet in no birds are the bulbs entirely absent, so far as I am aware. The olfactory membrane of birds presents certain structural peculiarities which are difficult to interpret. The nasal chambers which it lines are not large in any bird, but in some they are sufficiently extensive to suggest that olfaction is not completely in abeyance. The fact that they are better developed in birds which seek their food in the sea (petrels, the tropic bird, &c.), in which pursuit smell can, one would suppose, be of little service, than they are in most other birds seems to indicate that they have some function other than olfaction. Perhaps they serve to warm the inspired air; although here again we are confronted with the difficulty that, in the frigate bird (*Fregata*), in which the nasal chambers are relatively large, the nostrils are obliterated. Air may, of course, enter the nasal chambers through the cleft palate, but such a mechanism cannot provide for the warming of the air on its passage to the lungs. The teachings of anatomy being so obscure, it seemed to me desirable that direct observations should be made.

A study of the habits of flesh-eating birds shows that if they possess the sense of smell at all, it is not sufficiently acute to enable them to use it in finding food. All observers are agreed that when a carcase is hidden, by never so slight a screen, it is safe from the attacks of vultures and other carrion-seekers; but the most remarkable proof of the ineffectiveness of the sense (if it exist at all) is afforded by experiences which Dr. Guillemard was good enough to relate to me. Many times it has happened, he tells me, that, having shot a wildebeest or other game which was too heavy to carry home, he has dismembered it, and has hidden the carcase in the hole of an "ant-bear." On returning with natives to carry it to camp, he has found a circle of vultures standing round the spot where the offal had been thrown, completely unaware of the carcase within a few yards of their beaks. Of observations proving the possession of the sense I know none, unless we are willing to accept as evidence the belief, which is very general among fanciers, that birds are attracted to the smell of anise, and the similar belief of gamekeepers in some parts of the country that they are attracted by valerian. It is said that pigeons may be prevented from deserting the dove-cote by smearing their boxes with oil of anise. Poachers are supposed to lure hen-pheasants from a wood by anointing gate-posts with tincture of valerian.

With the view of testing the smelling powers of gramivorous birds, I placed a pair of turkeys in a pen which communicated with a large wired-in run. The pen was closed by means of a trap-door. In the run I placed, each day, two heaps of grain, right and left of the trap-door, but so far in front of it that they made with it an angle of about 50°. Various substances which give out a powerful odour were placed under one of the heaps, alternately the right and the left. The birds were lightly fed in the morning in their pen. At two o'clock the trap-door was raised, and they were admitted to the enclosure. It was curious to note that after the first few days the hen almost always came out first (in the last ten experiments this rule was broken but once), and invariably went to the heap on her right; the cock following went to the heap on the left. The cock usually tried the hen's heap after feeding for a short time from his own, but the hen never trespassed upon the preserve of the cock. In the earlier observations I placed beneath one of the heaps a slice of bread soaked with tincture of asafoetida, essence of anise, oil of lavender, or sprinkled with valerianate of zinc or powdered camphor. When the birds, plunging their beaks into the bread, took some of the tincture or essential oil into the mouth, the head was lifted up and shaken, but they immediately recommenced to peck at the grain. They were completely indifferent to the presence of camphor or valerianate of zinc. In several cases in which these substances were used, they consumed the bread. As a turkey does not steady the thing at which it is pecking, with its foot, but, seizing it in the beak, shakes it violently until a piece is detached, it is probable that most of the powder was shaken from the bread. As these experiments gave absolutely negative results, the birds showing neither preference for nor repugnance to any of the odorous substances used, I proceeded to stronger measures. The grain was placed upon a seven-inch cook's sieve, inverted. The odorous substance was placed beneath the sieve. Each of the following experiments was repeated three times, first with a small quantity of "smell," then with a great deal, and lastly with as much as possible. It is only necessary to describe the final tests. Four ounces of carbide was thrown into a saucer of water and placed beneath one of the sieves. There was no reason to think that the birds were aware of the existence of the acetylene which was evolved. The saucer was filled with bisulphide of carbon. The hen turkey finished her meal. When the grain was exhausted she knocked the sieve over with her foot. Both birds then lowered their beaks to within half an inch of the colourless liquid, which they appeared to examine. It is, perhaps, unfortunate that they had already satisfied their thirst at the water-trough. A bath sponge soaked in chloroform was placed under the sieve, the wire of which rested upon it. The hen finished her meal without leaving the sieve. Towards the end she

pecked very slowly, and frequently raised her head and stretched her wings as if partially narcotised. This experiment was repeated on the cock, but I could not detect any indications of narcosis. The saucer was filled with hot dilute sulphuric acid, into which an ounce of powdered cyanide of potassium was thrown. The evolution of prussic acid was so violent that I considered the neighbourhood unsafe. My gardener, who was working thirty yards away, spoke to me of the "smell of almonds." For some minutes the cock turkey fed with his usual eagerness; then, suddenly, he began to stagger round the enclosure, crossing his legs and holding his beak straight up in the air. He made his way back into the pen, where he stood with head down and wings outstretched. After ten minutes he returned to the enclosure, but did not eat any more grain. His comb and wattles were deeply suffused with blood.

In all observations on the sense of smell of animals we have an obvious difficulty to face. There is no reason for supposing that an animal enjoys an odour which pleases us or dislikes one which we find disagreeable. My dog appeared to be almost indifferent to bisulphide of carbon. He showed, however, great repugnance to chloroform and prussic acid. It is difficult to think that an animal which is unable to protect itself from the injurious effects of such drugs as these can possess the sense of smell.

I shall be very grateful to any of your readers who will give me information on this subject. Especially should I be glad to learn something about the habits of wingless birds, the mode of life of which, more or less, resembles that of a terrestrial mammal. In them, if in any birds, it would seem likely that the sense of smell would be efficient. In his memoir on the Apteryx, Owen stated that "the relative extent and complexity of the turbinated bones and the capacity of the posterior part of the nasal cavity exceed those of any other bird; and the sense of smell must be proportionately acute and important in its economy."

Downing College Lodge, January 26. ALEX. HILL.

The Origin of Radium.

IN the issue of NATURE for January 26, Mr. Soddy describes the present position of his experiments on the production of radium from compounds of uranium, and announces a positive result.

Since I wrote on May 5, 1904, pointing out that, on the theory of Rutherford and Soddy, the quantity of radium developed by a few hundred grams of uranium should be measurable in a few months, a quantity of about 400 grams of uranium nitrate has been preserved in my laboratory.

I am not yet prepared to give definite quantitative results, but Mr. Soddy's announcement may perhaps excuse a preliminary statement that the quantity of radium emanation now evolved by my uranium salt is distinctly and appreciably greater than at first.

A rough calculation of the rate of growth of radium indicates a rate of change far slower than that suggested by the simplest theory of the process, but somewhat quicker than that given by Mr. Soddy, who finds that about 2×10^{-12} of the uranium is transformed per annum. As Mr. Soddy says, it is possible that the total amount of emanation is not secured, and the fraction obtained may depend to some extent on the particular method used by each experimenter. But another possibility should be borne in mind. If a non-radio-active product, intermediate between uranium and radium, exists, the rate of appearance of radium would be slower at first, and quicker as the experiment proceeds. My uranium salt was not purified so successfully as that used by Mr. Soddy, and, when the first measurement was made a month or so after preparation, the yield of radium emanation was appreciable. It may be that Mr. Soddy is tracing the process from its inception, and that I have started at a later stage, where the rate of formation is somewhat greater. Further observation may be expected to elucidate these and other questions.

W. C. D. WHETHAM.

Cambridge, January 30.

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Fact in Sociology.

I ADDRESSED a letter to the editor of NATURE replying to what I allege to be misrepresentations and misstatements in a review of three of my books by "F. W. H." (December 29, 1904, p. 193). After a delay of some weeks due to the absence of "F. W. H." abroad, the editor of NATURE has written to ask me to modify and shorten my protest.

"F. W. H." told the readers of NATURE that my "Food of the Gods" "claimed to forecast the future." This was untrue, and I said so.

"F. W. H." mixed up my discussion of probabilities in "Anticipations" with my general review of educational influences in "Mankind in the Making," and presented this as my ideals. I pointed out that this was an unsound method of criticism.

"F. W. H." presented the following as my opinions:—"Germany will be cowed by the combined English and American Navies, and Anglo-Saxonism will eventually triumph. There remain the Yellow Races. Their star, too, will pale before that of the Anglo-Saxons." I repudiated this balderdash with some asperity. It is violently unlike my views.

He wrote of me, "he seems unaware of the part in the national life that is played by the lower stratum of society, the 'stagnant' masses as he would call them." I denied that I should, and pointed out that no one does know what part is played by any stratum of society in national reproduction. It is a field of unrecorded facts. I commented on "F. W. H.'s" assumption that he was in possession of special knowledge.

He wrote of "the fact that this stratum is an absolute necessity." This is *not* a fact. It may or may not be true. I commented on this use of the word "fact" in view of "F. W. H.'s" professorial sneer at my "imagination unclogged by knowledge."

He declared that I want to "get rid of the reckless classes, and depend solely on the careful classes," a statement which has not an atom of justification. He not only "guys" my suggestions, but foists an absolutely unconditional phraseology upon me.

Finally, he wrote, "we are to introduce careful parentage, *that is*, put a stop to natural selection." I quoted this in view of his statement that I had "no very thorough grasp of the principles of evolution." I discussed what appeared to be his ideas about evolution. They appeared to me to be crude and dull, and I regret I cannot condense my criticisms to my present limits.

I expressed some irritation at his method of misstatement followed by reply, and hinted a doubt whether my own style of inquiry—in spite of the fact that romances blacken my reputation—was not really more scientific than his.

H. G. WELLS.

The Fertilisation of *Jasminum nudiflorum*.

THIS well known plant, in accordance with its usual habit, has been flowering in my garden at Stonehaven, Kincardineshire, since the third week in December, 1904, and amidst frost and snow and cold winds. There are no leaves, but there are thousands of bright yellow flowers. It is a puzzle to me how fertilisation is effected. The two stamens are situated about half-way down the tube of the corolla, and about four or five millimetres below the style, which is, in many cases, two millimetres longer than the tube of the corolla. It seems to me to be a plant requiring the aid of insects in its fertilisation, but there are no insects to be seen at this time of the year. On January 22, as there was some sunshine, I watched the plant for about four hours, but no insect paid it a visit. At the same time I found the oblong anthers had split and pollen grains were sticking to the stigma in many flowers. The brilliantly coloured flowers, although destitute of scent, are fitted to attract insects, and the form of the flower seems adapted for their visits. But there are no insects! Can anyone offer an explanation? The plant is beautifully figured in the *Botanical Magazine*, lxxviii., tab. 4649.

JOHN G. MCKENDRICK.

University of Glasgow, January 24.