INTELLECT IN BRUTES

WE have received so many letters on this subject that we are compelled to content ourselves with giving the following extracts :—

The Rev. George Henslow comments as follows on some of the cases already adduced :—

I would not assert that what I call "practical reasoning"—that is, reasoning applied to objective facts directly apprehended by the senses—is fundamentally different from "abstract," *i.e.*, with no objective fact immediately present to consciousness; but they certainly do represent two stages in our own mental development.

E. H. Pringle's account of "Bully" shows nothing beyond what is common to dogs in practical cunning (*i.e.* reasoning) with objective things, (1) his "lady" friend, (2) best road to take so as not to be seen, (3) the person to be avoided, (4) E. H. Pringle's eye to be eluded. In the only point where abstract reflection was really required Bully failed, just as a child would, *viz.*, in shamming sleep. For, it is not enough *to lie down* and *shut one's eyes*. This is all a child is told to do, or is conscious of doing on going to sleep. The relaxation of every muscle follows spontaneously. Hence, as children do not think of this when pretending (since it requires reflection) they can so easily be detected by some rigidity of the muscles in the face or in breathing which at once betrays them. I have known a child overdo it by screwing up its eyes in order to appear *very fast asleep!* Exactly so, too, Bully was totally unable to think of the importance of putting his ears in repose.

Dr. Rae's dog only strengthens my case, for it clearly associated the bell with a *particular* maid, whereas a reasoning human being would have *generalised* that since the maid was in the room, the bell could be rung for some one else. Hence the dog proved its impotency in all power of generalisation, which is a pure form of abstract reasoning.

Dr. Muirhead's donkey was solely concerned with immediate sense-objects, the gate and the cows, and required no abstract reflection. That horses and donkeys can discover how to open gates is by no means uncommon.

Lastly C.M.'s cat and Mr. Belsham's kitten are the only cases I have yet seen which show a *primâ facie* evidence against the distinction I propose to draw. But, that a half-grown kitten could go through such a process of reflection analogous to what I gave for a hypothetical untaught dog ringing a bell, would be so astounding, that all possible explanations must be eliminated first, before it is credited.

Is it not far more probable that the cat and the kitten discovered by accident that the door was opened when a knock was made, and that this discovery arose from the common habit of cats to play with anything suspended within their reach? That animals discover facts, and then use them, will not be disputed, like the dog that, on discovering a stream carried him down too far on swimming across it, ran a mile up stream ever afterwards to allow for the current. Again, that animals mimic, as do parrots and apes, is common enough, but they do not know why they do it. A monkey might knock at a door after seeing a man do it, but, I believe, could have no similar motive as the man, until (like the kitten) it should accidentally discover for itself what the real use was, or else unless it be taught to do it.

In re rats gnawing pipes. I have just heard of a mouse gnawing through a gas-pipe. May it not be accounted for by the fact that, although the upper incisors of a rodent, by working on the lower, keep the chisel-like ends in order; yet this may be assisted by gnawing wood, lead, or other hard substances? Does not this account for rabbits, though well fed on cabbage and bran, &c., still persisting in gnawing their hutches?

I will, in conclusion, give another case to illustrate the want of abstract reflection: this time in a lady (aged thirty), whose mental powers were curiously arrested. Looking at the picture of a shark in the sea, with a pig in its mouth, in "Masterman Ready," and knowing that the pig had been dropped from the wreck to see if it would swim to shore, she *naïvely* asked, "Is the shark carrying the pig to the shore?" The idea of the shark eating the pig would only arise from the abstract reflection on the habits of sharks, which was not suggested by the story; the single objective fact present to her mind was that "the pig had to get to the shore."

Mr. Arthur Nicols writes :—

I cannot understand practical *reasoning*, but a practical result of reasoning upon either simple or abstract ideas is intelligible. Can we conceive any human being reasoning more correctly than a dog did in the following instance?—Towards the evening of a long day's snipe-shooting on Dartmoor, the party was walking down the bank of the Dart, when my retriever flushed a widgeon which fell to my gun in the river, and of course instantly dived. I said no word to the dog. He did not plunge in after the widgeon *there*, but galloped *down* stream about fifty or sixty yards, and then entered the water, and dashed from side to side—it was about twenty or thirty feet wide—working up stream, and making a great commotion in the water, until he came to the place where we stood. Then he landed and shook himself, and carefully hunted the near bank a considerable distance down, crossed to the opposite side, and diligently explored that bank. Two or three minutes had elapsed, and the party was for moving on, when I called their attention to a sudden change in the dog's demeanour. His "flag" was now up, and going from side to side in that energetic manner which, as every sportsman knows, betokens a hot scent. I then knew that the bird was as safe as if it was already in my bag. Away through the heather went the waving tail, until, twenty or thirty yards from the bank opposite to that on which we were standing, there was a momentary scuffle; the bird just rose from the ground above the heather, the dog sprang into the air, caught it, came away at full gallop, dashed across the stream, and delivered it into my hand. Need I interpret all this for the experienced sportsman? The dog had learned from long experience in Australia and the narrow cañadas in the La Plata that a wounded duck goes down stream—if winged, his maimed wing sticks out, and renders it impossible for him to go up—and will invariably land, and try to hide away from the bank. But if the dog enters at the place where the bird fell, the latter will go on with the stream for an indefinite distance, rising now and then for breath, and give infinite trouble. My dog had found out all this long since, and had proved the correctness of his knowledge times out of number, and by his actions had *taught me* the whole art and mystery of retrieving duck. His object—I say, without a doubt, because I had had numberless opportunities of observing it—was to flurry the bird and force it to land by cutting it off lower down the stream. Then assuming, as his experience justified him, that the bird had landed, he hunted each bank in succession for the trail, which he knew must betray the fugitive.

Mr. A. Petrie writes :—In my own family we had a tabby cat, who, when turned out, would let herself in at another door by climbing up some list nailed round it, then pushing up the click-latch, pushing the door, with herself hanging on it, *away* from the post, so as to prevent the latch falling back into its place, and then dropping down and walking back to the fire. I knew a Skye terrier, who, being told to carry a fishing-rod, carefully experimented along its length, to find its centre of gravity, then carried it on till his master came to a narrow path through a wood. Here Skye considered, dropped the rod, took it by the end, and dragged it under him lengthwise, till the open road was gained, when he took the rod by the centre of gravity again, and went on. This could not be a copy of human actions, but the result of original reasoning.

Mr. Henry Cecil gives the following on the authority of the late Mr. Dawes the astronomer :—

Being busy in his garden, and having a large bunch of keys in his hand, he gave it to a retriever to hold for him till he was at liberty. Going into the house soon after he forgot to reclaim the keys. The remembrance of what he had done with them only returned to him when he required to use them in the evening. He then recalled that he had given them to the dog, and forgotten to take them again. Calling him, and looking impressively in his face, he said, "My keys! fetch me my keys." The dog looked wistful and puzzled for a moment, and then bounded off to the garden, his master following. He went straight to the root of an apple-tree, scratched up the keys, and brought them. May we not fairly put into words the dog's train of reasoning thus: "My master has given me these keys to hold; he has forgotten them; I cannot carry them all day; but I must put them in safety where I can find them again?"

Mr. W. S. Chamberlayne writes that many years ago, taking an afternoon ride through a wood in the Bahamas, he came to a gate which was kept closed by a small iron hoop hung over a post and the end of the gate. To open the gate he leant over his horse's neck and lifted up the hoop, shutting the gate

and replacing the hoop when he had passed through. On returning from his ride the gate was still shut, when, to his surprise, his horse, without any hesitation, took the hoop in his mouth and tried to lift it off the gate. He, however, was not successful in his efforts, and Mr. Chamberlayne had to finish the operation for him, but the exhibition of memory was certainly remarkable.

Mr. T. B. Groves, of Weymouth, sends the following account given to him by a relative, a gentleman well known in the district, and who would be everywhere accepted as a trustworthy and competent observer :—

In the wine-cellar two vessels, one an open earthen jar containing hazel-nuts, the other a wooden sieve, tub, or something of the kind, full of wine-corks, stood side by side. It was observed that the nuts were gradually diminishing, owing to the depredations of mice; but after a time this seemed to have altogether ceased, and it was inferred that the difficulty of egress had caused the mice to abandon the enterprise as soon as the level of the nuts had reached a certain depth from the mouth of the jar. Matters so remained for some little time; but afterwards, on visiting the cellar, it was found, to the owner's great surprise, that his nuts had now entirely disappeared, and in their place were discovered the corks! The only explanation that could be suggested was this: that the mice, *reflecting* on the difficulty of making their exit from the partially-emptied jar, had *conceived* and carried out the plan of providing for their escape by dropping into the jar from time to time sufficient corks to enable them to make a safe retreat with their plunder.

Mr. R. Howson sends us the story of a terrier-like dog of no particular breed, named Uglymug, who had a poodle for companion. Whenever Uglymug saw signs of a family meal being laid out, he inveigled the poodle into a labyrinthine shrubbery under pretence of seeking for rats, and when the latter was fairly intent on its game, Uglymug sneaked back to enjoy all by himself what he could get from the family table.

V. I. writes :—The following instance will show that in the case of the mule intelligence has a limit. We had a mule who could take the staple out of a gate and open it (he never shut it). This mule used to go to the water-butt, turn the brass tap, and drink, but never turned the water off. Common sense would have forbidden a human being neglecting such a precaution.

Mr. E. Parfitt, of the Devon and Exeter Institution, writes of a favourite cat :—She would frequently come and sit near the door opening into the library of the institution. The door only divides my house from the library; puss would place herself here mostly at dinner-time, and, as I am informed, not before; she would wait here until she heard my footsteps down the library; she would then proceed directly to the kitchen, and inform the servant, either by mewing or looking up into her face. She would then come to me and tell me in her way that she had ordered dinner. I have seen her scores of times trotting along the passage to the kitchen, when I have opened the library door, to inform the servant that I was coming. How Topsy ascertained the time to proceed to the door I do not know, except that she saw that dinner was preparing; but how did she know the time it would be ready and the time that I was expected to come in?

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

The Association for promoting the Higher Education of Women in Oxford is to open two halls in Oxford in October for the reception of lady students. One of these is to be an "Academical house on the principles of the Church of England," and in the other, "Somerville Hall" (after Mrs. Somerville), care will be taken that members of different religious denominations are placed on the same footing. The charges in the latter will be considerably lower than in the former.

Two Combe Exhibitions of 35*l.* each will be open for competition in May next at Trinity College, Oxford. Candidates will be at liberty to offer classics, mathematics, chemistry, and physics, a period of history, or any two or more of these branches of study. There is no fixed limit of age. The examination, which will be combined with the ordinary Matriculation examination, will commence on Tuesday, May 20, at 9 A.M. Names, with subjects offered and testimonials of good conduct, to be sent to the president not later than May 12.

The Astronomer-Royal continues to give evidence of his intense desire for the promotion of sound mathematical training, and has published to the Cambridge Senate his views as to the papers set in the Smith's Prize examinations of recent years, classifying the questions set, and showing that several subjects, more valuable, in his opinion, to men of science and to students, than all the others together, have had no questions set upon them. Among these are attractions, higher dynamics, perturbations, figure of the earth, thermodynamics, waves and tides, sound, physical optics, &c. He says very pertinently: "The use of an examination is to test the power of a candidate to command the application of mathematics when required. The use of publication of examination is to guide students in the subjects recommended for their study. The guidance which too many of these subjects intimate is this: that clever and abstruse algebra, without any reference to its benefit as an application of a tool to other purposes, is the *summum bonum*." He believes this guidance is against the instincts of many residents at Cambridge and the desires of undergraduates.

Progress is evident at Cambridge in response to the memorial we recently referred to against the compulsory study of Greek by all undergraduates. Very few votes prevented reform years ago; no doubt the claims of science students and of liberty for all will now be more fairly listened to. The syndicate on the subject includes Dr. Humphry, Professors Liveing and James Stuart, and Mr. Todhunter, and thus the real interests of mathematics, physics, biology, and medicine, as regards the education of students, as well as the progress of science, will be sure of recognition.

The examiners in the Cambridge natural sciences tripos this year are Dr. Humphry, Prof. Bonney, Mr. J. F. Walker, (Lecturer on Chemistry at Sidney Sussex College), and Mr. Yule, of Magdalen, Oxford, the foregoing being re-appointments, and Prof. Liveing, the Rev. J. W. Hicks (University Demonstrator of Chemistry, and Lecturer on Botany at Sidney Sussex College), Mr. W. Garnett, Demonstrator of Experimental Physics, and Mr. F. M. Balfour; the latter three are fresh nominations.

In the last Cambridge Local Examinations (December, 1878), among 626 senior boys there were 92 candidates for the chemistry paper and 44 for practical chemistry; of 997 senior girls, 29 took the paper and only 4 the practical examination; 21 boys and no girls entered for experimental statics and dynamics, &c., 38 boys and 24 girls for heat, 30 boys and 4 girls for electricity. The result is that only 3 boys, 2 from the Liverpool Institute and 1 from Newton College, Devon, obtained the mark of distinction in the section "natural philosophy," in which all these subjects are included; and no girls. It should be added that a pass may be attained on two of these subjects, and only three in all may be taken by any candidate. Is it possible to show more strongly the lack of attention to and interest in the elementary forces of nature in English schools and by English parents? These are boys and girls between sixteen and eighteen years of age, most of them supposed to be ready, or almost ready, to leave school and take part in the battle of life. Among 3,329 junior boys and 1,483 junior girls, 423 boys and 13 girls took the chemistry paper, 169 boys and 1 girl the practical chemistry, 76 boys and no girls statics, &c., 178 boys and 12 girls heat. Seven boys, the majority from Liverpool College, and no girls, obtained distinction. We do not become further consoled by finding that 15 senior boys and 79 senior girls took zoology, 11 boys and 177 girls botany, 24 boys and 150 girls geology; for girls have no *more* right to a scientific training than boys. Most likely, however, boys and their teachers will seek to know more of the life and the past history of the globe when they find that girls can really hold their own in and enjoy these studies, and look with amazement on men for being so unwilling to learn or teach them. Among the juniors, 75 boys and 148 girls took zoology, 45 boys and 238 girls botany. These numbers, however, represent no great attainments as yet, for the standard of passing is very low; severity would only kill the tender growth. But evidently there is in secondary schools little belief in the educative and attractive power of the study of nature. Why is it not considered that *mathematicians* are fostered by neglect and hindrance? It appears to be thought capital training to produce physicists and naturalists. Really, conservatism and unwillingness to take a little trouble are the enemies.