

THE USES OF TAILS IN ANIMALS.

A general meeting of the Natural History and Microscopical Society was held on Monday night, at the Mitchell Institute; Mr. A. W. Wills presiding. A paper was read by the FRASTER, prepared by Mr. Lawson Tait, on "The Uses of Tails in Animals." He said it was not difficult to imagine how the prehensile tails of monkeys, apes, or other animals, or the fly switches of the horse or cow, had been useful in the struggles of those animals to master their surroundings; but there were some forms of the appendage which puzzled them to see how they could ever have been available as assistants in survival, and still more, how they were still perpetuated in their apparently purposeless forms. Amongst these the bushy tail seen in the fox, dog, cat, &c., had long attracted his attention; but no intelligent meaning of it suggested itself until he came into possession of a cat who was perfectly deaf, and on whom he could therefore perform many experiments which would be impossible in an animal possessed of hearing. Like all cats, he was very fond of a warm place, and when he was asleep nothing but a touch or very strong vibration communicated through what he was lying upon would wake him. If he went to sleep before a big fire, he slept lying on his side at full length, with head, tail, and limbs all stretched out; but if screens were placed between him and the heat he gradually coiled himself up, apparently without waking, covering his limbs with his tail and head, so that as little surface as possible was exposed for loss of heat. If, in addition to screening off the heat, a direct current of cold air was directed on to him by means of a bellows, he soon buried his nose in the fur of his tail, or between his tail and thigh, so that almost the whole of his face was protected. On the heat being readmitted the whole movements were reversed, and he resumed his extended position. The use of the tail was clearly, therefore, completely analogous to that of the respirator worn by people with delicate chests, the object being to extract from the expired air, by means of fur in the one case, and wire gauze in the other, the heat which was being taken out with it; so that the cold inspired air should be raised in temperature before it reached the lungs, and thereby conduce to a conservation of the body heat. Some interesting considerations here on this. Animals provided with bushy tails seemed to be so as a matter of correlation of growth, their bodies being always provided with thickly set and more or less soft fur. He (Mr. Tait) could not find an animal with a bushy tail which could not and did not lie curled up when asleep. He went round the Zoological Gardens at Dublin on a very cold morning in February, in company with Professor Huxley, and they found the six-foot and nine other bushy-tailed animals curled up with their noses buried in the fur of their tails. In the squirrel this use of the tail was very marked, and in birds the same object was accomplished by their burying their heads in the down of their shoulders. Animals provided with bushy tails, so far as he could find, were all solitary in their manner of living, and therefore one essential for their survival was some method by which variations of temperature should be resisted. The use of the tail for this purpose was, he thought, best of all illustrated in the great ant-eater (*Myrmecophaga jubata*), in which the hairs of the tail reached a very great size, and covered the animal when reposing, so that he looked like a bundle of dried grass. It might also in this case serve as a protection by mimicry. Mr. Wills stated that the animal used his tail as an umbrella in a shower, and that the Indians diverted its attention from themselves by rustling the leaves in imitation of a falling shower, and while he was putting up his umbrella they killed him. Some of the *Myrmecophaga* had the lower end of the tail naked, and used it as a prehensile organ, whilst the upper part remained covered with long hair, and was used as a respirator. In other eulentalous animals, living in tropical countries where they were not subjected to extremes of temperature, the long hairs were replaced by scales, as in the pangolin, or the fact was absent as in the sloth. Among the rodents two very curious contrasts in the matter of the tail were presented by the guinea pig and the squirrel. The former was gregarious, and any one who had kept a batch of guinea pigs must have seen how they protected themselves from loss of heat by packing themselves in rows, arranged heads and tails; whilst the squirrel was solitary and in his nest, during his winter sleep coiled himself up and covered his face with his tail. The same was seen in the dormouse, and in the gerbil during hibernation. Of the carnivora, those who had bushy tails were all solitary in their method of living, though the wolf and jackal hunted in packs, and those with the bushiest tails were most exposed to low temperatures, as the arctic fox and the sable. Of the quadrupeds, the marmosets afforded a striking instance of a bushy tail as a probable provision for protecting these delicate creatures from depressions of their temperature. He had received an interesting letter from Mr. Darwin on this point, in which he said, "Your view is new to me, and has only to be suggested for its probability to be recognised. I presume that of course you would thus account only in part for the retention of a tail and for its modification. Your view does not preclude the conjoint use of the tail for other service, as for gliding through the air when flattened, as in the squirrel, or as a signal to beasts of prey, in accordance with Mr. Bates's ingenious suggestion in his Nicaragua travels, with respect to the great bushy and conspicuously-coloured tail of the skunk. I wish we knew the use of the extraordinary tail of the yak, which inhabits such cold regions, whether it serves solely as a fly-sapper. If poor Dr. Falconer had been alive he could have told us." In reply, he (Mr. Tait) said that he had missed the yak in his search for animals with bushy tails, but he found that the yak also had a long abdominal fringe of hair nearly touching the ground. When the animal lay down with his limbs drawn up to or under him, as all ruminants did, his tail and fringe would act as a rug, preventing loss of heat from the limbs and damging to them from frost-bite, as the tissues outside the bone were thin, and there was nothing but a rather weak circulation to resist loss of heat. The yak lived close to the line of perpetual snow, which was the condition in which such epithelial appendages as he had would most conduce to survival, and therefore that in which they would be most easily evolved by natural selection. This seemed to point out a curious study of the mechanical arrangements which existed in animals for the conservation of heat—a very important element in the struggle for life. Some forms of tails were yet a puzzle to him—notably the tails of rats and mice, for which he had as yet found no reasonable explanation.

BIRMINGHAM POLICE COURT.

YESTERDAY.