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The Economist

Killer genes ate my dog; animal behavior. (are pit bulls inherently dangerous)

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IF YOU believe Britain's tabloid newspapers,

man's best friend has been turned into his worst enemy. The American pit-bull terrier is the most recent in a string of large dogs with big teeth and short tempers which have terrorised the British public. The breed's enemies, including the government ministers who want to wipe it out, say it is worse than all other dogs, and inherently dangerous. Defenders claim that, in the hands of a sensible owner, the pit-bull will cause no more trouble than any other breed. There is good reason to doubt this.

The pit-bull has been bred as a fighting dog. German shepherds, Dobermann pinschers and rottweilers are all bred to guard human masters, their livestock and their property. Pit-bulls are designed to kill other dogs. Their large heads and strong jaws make pit-bulls ideal for the fighting life. But it is the unpleasant behaviour bred into the dogs that makes them particularly nasty:

* Arousability. Pit-bulls are much more easily aroused than most dogs. Arousal is controlled by a part of the brain called the Reticular Activating System (RAS). The amount of L-tyrosine, a chemical which passes messages from nerve cell to nerve cell, seems to play a role. Since they are genetically controlled, L-tyrosine levels can be changed by selective breeding. More easily aroused breeds have been shown to have lots of Ltyrosine in the RAS. It is a fair bet that pit-bulls do, too.

* Changes in the RAS may also account for the dogs' perseverance. Pit-bulls are incredibly tenacious. Once they are fixed on a target, they are all but impossible to distract. The little girl whose recent ordeal propelled pit-bulls into the headlines suffered a 15-minute attack. The dog's owner and two other adults could not stop the animal, though they beat it until it bled.

* This is due to the dogs' insensitivity to pain. To the extent that pain does influence a pit-bull, it may encourage it rather than dissuade it. Most dogs which have been beaten in a fight will cringe submissively when they next meet the victor. A pit-bull will attack. Again, this seems to be a matter of brain chemistry. Endorphins are generated by the body to block pain (morphine and its relatives work by mimicking this effect). Their reactions to anaesthetics suggest that pit-bulls are more than usually sensitive to endorphins. They may also generate higher levels of them. This would enable them to withstand a lot of pain. And endorphins, like morphine, are addictive. The dogs may be junkies, seeking pain so they can get the endorphin buzz they crave.

* The pit-bull's body signalling has also been distorted. Most dogs will give notice before they attack. Pit-bulls attack without warning, in order to get the advantage of the first strike. A dog will generally bow to another if it wishes to play. When a pit-bull makes this signal-universal among other breeds-it may follow it with an all-out attack. In effect, it is lying about its intentions.

Not all the traits that have been bred into the pit-bull are bad. They ought, in theory, to be fairly safe to handle, since (at least among those who breed them for fighting) pit-bulls which attack men have usually been killed. But this culling probably tailed off when the dogs became popular as pets. So today's dogs have the temperament for fighting, but little discipline.

So much for nature. How much is nurture? A common feature of allegedly aggressive breeds is that their litters include many potential "alpha" animals. Alphas are likely to try to lead any pack they find themselves in. Although alpha potentiality is probably inherited, dominance depends on the circumstances of the dog's upbringing. Here, the owner's behaviour matters. A dog may come to believe it is dominant without the owner realising that this has happened. Then, when a conflict arises, the dog becomes aggressive, whereas an animal which did not think it was top dog would submit.

In general, if pups are scrutinised for the signs of a tendency to dominance, and then disciplined appropriately, they quickly stop making trouble. But it is unlikely that this would work for the pit-bull, whose behaviour deviates so much from the normal pattern of a dog's life.

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