

in could damage the US “engine of innovation” by weakening patent protections for inventors.

Such are the muddled waters that Congress has been navigating as it seeks to respond to the cries of technology companies and of President Barack Obama’s administration, which want to crack down on lawsuits launched by ‘patent trolls.’ No fairy tale, these entities are essentially holding firms to ransom, threatening organizations that are making use of the innovations with expensive, time-consuming lawsuits if they do not pay to license the patent. A 2013 attempt to curb such legislation met with failure last year. Lawmakers now seem to be making progress (see page 270).

Much of the scholarly debate boils down to a difficulty that has also plagued Congress: how to define a troll. Universities, too, license their patents, often for a fee, to those who want to use their researchers’ inventions to create a product or service. As such, they are considered ‘non-practising entities,’ a more-polite term than troll, but the two labels are often used interchangeably.

Scholars generally argue that universities should be considered differently because they work towards a social good and their patenting efforts spur innovation based on academic discoveries. This is in stark contrast to a troll, which accumulates weak, broad patents with the sole intent of using them to push firms into settling a lawsuit before the expense of the litigation damages their business. Lawmakers in the US Senate seem to agree with this distinction, and last month created a carve-out that excludes universities from some of the proposed measures for cracking down on patent trolls.

But the distinction has fuzzy boundaries: some universities are

highly aggressive in monetizing their patents, even licensing them to companies that are considered to be trolls (see *Nature* **501**, 471–472; 2013). Earlier this year, the Association of American Universities and the Association of Public and Land-grant Universities took a step in the right direction by urging their members not to align with trolls. Universities should heed that guidance or risk losing the faith of Congress and the

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public. The Senate loophole for institutions of higher education was a political necessity in the face of heavy lobbying by universities, but that lobbying would have been much less persuasive had it not been tied to widespread public trust.

As Congress has wrestled with definitions, its overall approach for deterring frivolous lawsuits has remained fairly constant: make them more risky for the plaintiff. It is a welcome change to a system that is much too easy to exploit, but it is a blunt tool that could jeopardize the ability of small firms to defend their intellectual property. And even if it succeeds in Congress, it will not tackle the underlying problem: the US Patent and Trademark Office is granting far too many vague and redundant patents. This is a particular problem for software, but affects other fields, too.

Measures to raise the bar — including a process that allows parties to challenge a patent without needing to resort to litigation — may be having an effect: the number of patent lawsuits dropped by 18% between 2013 and 2014. But it is important not to see patent-troll legislation as a panacea. Fundamental changes at the patent office remain the key to curbing abuse. ■

The kill switch

Brain researchers and social scientists are well placed to find out what makes humans murder.

Groups of humans have always slaughtered those who belong to other groups. The twentieth century was shot through with numerous examples, from the genocides of Armenians in Ottoman Turkey and of Jews in Nazi Europe to the massacres of ethnic rivals in civil wars in Rwanda and Bosnia during the 1990s. Today, the fundamentalist group ISIS is spooking the world with its willingness to butcher others who do not adhere to its extremist form of Islam.

Attempts to understand such events tend to focus on political reasons. But a conference in Paris last month dared to ask a different question: how, biologically speaking, do normally non-violent and psychologically stable people overcome the instinctive human aversion to killing when faced with circumstances of war or extremism? What drives them to participate in acts of genocide? This is arguably the biggest challenge for interdisciplinary dialogue across the fields that consider brain and behaviour.

All human behaviours originate in the brain, which computes cognitive and emotional information to decide what to do. So what, precisely, happens in that organ at the moment that a person’s natural abhorrence of harming others is computed out of the equation?

The organizers of last month’s conference at the Paris Institute of Advanced Studies — ‘The Brains that Pull the Triggers’ — deserve credit for even posing this question. It goes against another human instinct: to consider evil in moral rather than biological terms, as if identifying a biological signature in the brain might somehow be exploited as an excuse to absolve a person of his or her responsibility.

Neuroscientists have studied the abnormal condition of psychopathy in addition to components of normal cognition — such as the recognition of emotions in the faces of others — that may have a bearing on

the problem. And psychologists and sociologists have looked at the behaviour of ordinary individuals who identify themselves with particular groups and align their behaviour with that group.

The conference brought researchers from these disciplines together, along with historians who presented sobering data on the behaviour of soldiers in wartime. One presentation included documentation from post-Second World War interrogations of hundreds of untrained German reservists who were recruited to active service in 1942 and went on to slaughter tens of thousands of Jews in Poland. Transcripts revealed that their distraught commander had allowed anyone to opt out of killing — but only 1 in 10 did so.

This is tricky terrain for academics, and many researchers at the conference admitted some discomfort at being asked to consider their findings as being relevant to the neuroscience of repetitive killings. For some of the sociologists, it felt like an attempt to medicalize a social issue. For some neuroscientists, it felt like over-extrapolation of results from much simpler experiments. In the air was an uneasy feeling that such interpretations could seem superficial and trite, and could trivialize crimes against humanity.

In fact, the researchers present made a brave contribution to what was a bold and important attempt to bring a multidisciplinary approach to one of the biggest questions facing humanity.

The answer will not come quickly, but research has already identified some useful paths to follow. Neurosurgeon Itzhak Fried from the University of California, Los Angeles, for example, proposes that ordinary people are able to become repetitive killers because changes in neural circuitry free the ideology-fed, cognitive parts of the brain from the emotional parts of the brain, which normally keep actions in check.

A better understanding of brain circuitry could not, of course, influence the political forces that create the conditions for mass murder. But discussion of such politically neutral basic neuroscience could allow progress while avoiding unhelpful rhetoric.

And findings in basic science could have a direct impact: perhaps by helping to find ways of educating people to make them less likely to succumb to ideological requests or commands to kill. ■

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