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Rethinking the brain

Critics of the European Human Brain Project were justified, says an independent report on the project. Both its governance and its scientific direction need to be adjusted.

Just like the human brain itself, the European Commission's billion-euro Human Brain Project (HBP) defies easy explanation. Launched 18 months ago, the massive project is complex and, to most observers, confusing. Many people — both scientists and non-scientists — have thus accepted a description of the project that emerged from its leaders and its publicity machine: the aim of simulating the entire human brain in a supercomputer and so find cures for psychiatric and neurological disorders.

Like many simplistic explanations of the brain, that characterization of the project provoked a backlash from neuroscientists. This climaxed in a full-scale uprising last summer, when hundreds of researchers signed a critical open letter to the commission (www.neurofuture.eu). Autocratic management, they complained, was running the project off its scientific course and exaggerating its clinical reach.

An independent committee was established to investigate and mediate on the dispute. Last week it published its report. This time, the main points were easier for outsiders to decipher. The rebellious neuroscientists who made the complaints were correct. The brain project is failing and must be fixed.

The committee's criticisms endorse more or less all the concerns of the scientists. The project fails not only in its governance, the report says, but also in its scientific plan — particularly the core aim, the simulation of the entire brain that critics had long dismissed as unrealistic.

The depth of the governance issues are exemplified by this statement in the report, which refers to the project's de facto leader, Henry Markram of the Swiss Federal Institute of Technology in Lausanne. "The co-ordinating scientist … is not only a member of all decision-making, executive and management bodies within the HBP, but also chairs them and supervises the administrative processes supporting these bodies. Furthermore, he is a member of all the advisory boards and reports to them at the same time. In addition, he appoints the members of the management team, and leads the operational project management."

Although egregious, the governance problems should be straightforward to fix. There isn't much left to invent about good governance, and the HBP's board of directors was quick to enact some of the necessary changes even before the report was published. For example, last month it dissolved the three-person executive board in which power had been concentrated.

Such a change is not sufficient, however, as the independent committee makes clear. Changes in scientific direction are essential. After all, it was the decision of the project's (now defunct) executive board to eliminate cognitive and systems biology from the next phase of the programme that triggered last summer's revolt.

The report says that ambitions for whole-brain simulation are premature and that the HBP should refocus on enabling methods and technologies, particularly innovative software and hardware platforms for neuroinformatics. It goes further. These platforms, it says, should be developed and carefully validated by interdisciplinary collaborations that involve cognitive and systems neuroscientists. And they should address concrete problems — such as spatial navigation or goal-directed decision-making.

It also says that the project was wrong to rule out research in non-human primates, because this would provide an important stepping stone between the tiny mouse brain, in which most neuroscience data have been generated, and the human brain.

"The brain project is failing and must be fixed."

What now? For the mediation process to be successful, the HBP will not only have to accept the report but also "faithfully implement the recommendations". Yet, according to the report, most members of the HBP board of directors feel that the mediation committee's recommendations would turn their "visionary project into an average one", and say that *in silico* brain simulation is the "unique selling point of the HBP".

The scientists who signed the open letter pledged not to collaborate with the HBP unless their concerns were addressed. For the HBP to continue, the board of directors, whatever their doubts, must now win back trust by pledging to carry out the mediation report's recommendations on the science.

If they do, all will have an easier time understanding what the HBP is: a project aiming to put in place new technology to help neuroscientists understand the human brain and its diseases.

That is a more modest, but still magnificent, aim, and a perfect complement to the US BRAIN Initiative, which supports the development of other types of neurotechnologies. With the tools in place, one of the biggest challenges to science will be ready for systematic assault. ■

Applied prestige

The UK research assessment should inspire everybody to reward excellent societal impacts.

For many involved in the United Kingdom's mammoth national assessment of university research, the release of the results late last year marked the end of the process, or at least a welcome rest from it. But for a hard core of research-policy wonks, assessment never sleeps. So begins a new phase: assessment of the assessment. A meta-assessment? This is not as insular as it might sound. Policy-makers have to decide whether the original assessment was worthwhile, how to develop it if so, and whether it should be repeated.

University-funding agencies have commissioned independent experts to pick over the results. The first such analysis is published