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The Military-Industrial Complex, or, as it was called in the United States, the Military-Industrial-Congressional Complex, is an informal, unspoken and under-scrutinized tri-lateral arrangement of mutual benefit between the military, defense contractors, and political institutions. All three parties benefit: one side from the procurement of weaponry and hardware, one side from being paid to supply that weaponry, and one side from the lobbying for the political approval for state spending to make the payments.

Although the term has been used to describe the network of military forces, industrial corporations and political institutions involved, it is perhaps best visualized by the so-called *iron triangle*, which defines the mutually-supportive influence, financial, and policy-making (and *policy-applying*) relationships between the executive branch of government, the legislature, and special interest groups (1). The legislative branch gets electoral support from special interest groups, which sustains it in power; it uses that power to provide political approval for funding for the executive and its bureaucracy (Ministry or Department of Defense); the special interest groups benefit from low regulation, little oversight, and state spending, some of which pays for the next round of lobbying of the legislature.

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The BigTech–Academia–Parliamentary Complex and Techno-Feudalism

Another iron triangle can be seen in any airport by anyone dismayed by the paucity of free seating and the hard-sell of trapped consumerism in the airport terminal. It is generally a less pleasant experience compared to the relative tranquillity of the members-only airport lounges, where most of the “members”

are members by virtue of the corporations for whom they work. So the corporations lobby the politicians, the politicians approve of a low tax for aircraft fuel, the airlines provide facilities for the corporate travelers.

In fact, these iron triangles can be seen in many domains of enterprise, and are a particular feature of



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banana republics (2). This is a term originally used to describe nation-states with an unstable economy dependent on a limited-resource export, and a gerrymandered, corrupt, and self-serving political elite, such as (at the time) Honduras, Guatemala, or other Central American republics. However, it is also a term that contemporarily can be

used to describe nation-states with a destabilized economy dependent on self-exploitation through neo-colonialism (3), and a gerrymandered, corrupt, and self-serving political elite, such as the United Kingdom. Another feature of a latter-day banana republic is the “revolving door” between those who were responsible for legislation in some domain, at one point in an iron triangle, and their subsequent appointment to a position such as executive director on the board of some special interest group in another point of the iron triangle.

ment 2010–2015 (i.e., before Clegg was absolutely shafted by Cameron in the General Election of 2015, losing his own Sheffield Hallam parliamentary seat in the process,¹ and before Cameron immolated himself by losing his own hopelessly misguided and mismanaged EU referendum). Amongst Clegg’s political “achievements,” one can point to the marginalization of the Liberal Party as a counterbalancing force in British politics, the ruination of any prospect of meaningful electoral reform for a generation, and the modification of a student loan system for university tuition fees that is little better than indentured servitude²: a person employed within a system bound by a contract that

is asymmetrically biased in favor of the contractor and essentially unbreakable or irredeemable.

With such a track record of achievement, one might suppose that gainful employment might be relatively difficult. However, in October 2018 Clegg was appointed as a lobbyist and public relations officer in his role as Vice-President, Global Affairs and Communications ... for Facebook. While there is absolutely no suggestion that being a senior

U.K. politician and becoming a Vice-President of a social media company are connected by such a revolving door, it does rather beg the question of what the iron triangle for online social media, and the BigTech³ companies in general, might look like.

One perspective is that this iron triangle is formed by the BigTech-Academia-Parliamentary Complex. Academia produces graduates; the graduates are employed by the MegaTech companies; the MegaTech companies lobby the politicians; the politicians give political approval for spending on and by academia. Or, the MegaTech companies provide direct financial support for academia; the academics provide scientific advice to the politicians; the politicians use the advice to support evidence-based policy making in formulating regulation of the MegaTech companies. All very cozy, and could even be very constructive: what could possibly go wrong?

Well, quite a lot actually, if we look at each of the bi-directional flows. Starting with the graduates, it is clear that some university courses are compressed in content, issues of professional ethics are sidelined, and design, creativity, freedom of inquiry, freedom of expression and creative thinking are all suppressed. In the words of George Carlin “Governments don’t want well-informed, well-educated people capable of critical thinking. They want obedient workers, people who are just smart enough to run the machines and do the paperwork. And just dumb enough to passively accept it.”⁴ It sometimes feels that the BigTech

¹Nice work, Sophie ©

²U.K. university students taking loans typically owe £40-50 000 on graduation. The “loan book” was sold to a private company, the Student Loans Company. This business now charges around 5% interest on the loan, when interest paid on savings often amount to less than 1%; consequently even in employment the loan can increase faster than students can pay it off. The company is empowered to demand highly intrusive access to students’ financial statements, as well as their parents, to determine how the student is being supported. The loan cannot be escaped by bankruptcy, or moving abroad. It does expire after 30 years, but the outstanding loan is then redeemed by the taxpayer. The U.K. government itself only expects about 30% of undergraduates to repay their loan in full (5). The personal, social, political, and economic consequences of indebting of a generation to pay for their own education are to fully unravel.

³There are various terms for the dominant organizations in the Information and Communication Technology industry, including “Big Tech”, “Mega Tech”, and “Tech Giant”, with various acronyms for the organizations involved, including GAFAM, FAMGA, FAANG, and our own FANG-TUM (menace: see (6)).

⁴<https://www.youtube.com/watch?v=cPAq8aH-FyQ>.

With techno-feudalism, what is paid and permitted in a digital space is decided by asymmetric power, not mutual consent.

companies want something similar from their employees, too: people just smart enough to operate the machinery, people not trained enough (but certainly paid enough) to ask any difficult questions (about say, surveillance capitalism (7), the intrusion of AI (8), digital dependence (6), (9), and so on).

Secondly, some BigTech companies distort, or allow themselves to be used to distort political-decision and information-dissemination (knowledge aggregation) processes. The role of Cambridge Analytica and its interference in the U.K. EU referendum is well-documented (10). However, equally disconcerting, in the context of the COVID-19 pandemic, is the control of misinformation. There is a tangible risk to public health if the scientific pursuit of a vaccine against the disease has to contend also with a vociferous, scientifically-illiterate, and uncompromising “anti-vax” minority, which might cause a low uptake to render any vaccination program ineffective. (These problems are exacerbated by the potential for foreign intervention in sovereign political processes,⁵ and/or mercenary troll armies whose purpose it is to insert misinformation into a national consciousness and give it a specious credibility by apparent preponderance).

Thirdly, political approval for funding programs and processes tends to benefit the BigTech organizations. Two examples in the U.K. are first the creation of Doctoral Training Consortia (DTC) and second the impact of research. The motivation for DTCs is to provide cohort-level education programs, but an emphasis on completion according to a rigid four-year time-

table and on *work*-based skills training risks suppressing diversity and encouraging conformity, as well as distracting from *research*-based skills training (like how to ask awkward questions). Moreover, a four-year program where the supervisor is obliged to give the student the research question from the outset, is different from one that only specifies the area and helps the student learn to ask a meaningful research question (and learn sometimes by failing). For evaluating grant proposals and research outputs, the requirement for quantifying impact, especially economic impact, suppresses blue-skies thinking in favor of short-termism. It is arguable that much of the impact of deep-learning and other algorithms can be traced back to research on artificial neural networks initiated in the 1980s (they just had to wait 30–40 years for advances in computing, networking, and devices to yield enough data, timely communication, and sufficient processing power to make the algorithms effective: admittedly a strong economic incentive helps).

While politicians fund areas and processes that are favorable to BigTech, in an academic world where appointments and promotions are correlated with funding, the BigTech companies could be selective in who they choose to fund directly. There is no suggestion that this happens, conveniently overlooking the phenomenon of funding bias (13), but the risk if it were to happen is that those so selected might not offer impartial scientific advice to provide the basis for evidence-based policy making.

Finally, political approval for funding programs focuses not just on educational programs that produce graduates of the kind wanted by

BigTech, but also on regulation that favors BigTech. This is particularly so with respect to taxation. It is hard to run this experiment, so this is a claim: if one took an 18-year old and sat her on a sofa for four years, afterwards no BigTech company would offer her a six-figure salary. If one took an equivalent 18-year old and sat her in a University for four years, afterwards some BigTech company might offer her a six-figure



Political approval for funding priorities, education programs and regulation all favor Big Tech.

salary. It is quite clear who has added the value (the University and the hard-working student herself), and it quite clear who is paying for it (mostly the graduate, through the loan scheme); but it equally clear who is one of the primary beneficiaries — the BigTech employer. If there absolutely have to be student loans, there is a “fairer” solution: first, a graduate tax, such that every graduate pays progressively (and so everyone who benefits pays proportionally and according to their means, not just those without wealthy parents or corporate “golden handshake” inducements which write off the debt); and second, an effective corporation tax so that corporate beneficiaries also make a contribution to the social fabric and common good).

The emerging problem when governance, regulation, and taxation is so weak, and the special interest groups that are supposed to be governed, regulated, and taxed grow over-powerful, is what we are calling *techno-feudalism*.

⁵Interestingly, Nick Clegg still denies that there was any Russian interference in the EU referendum (11), although Ministers have been told they can no longer say there have been “no successful examples” of Russian disinformation affecting U.K. elections (12).

Feudalism was the dominant socio-political system in medieval Europe, in which the aristocracy held lands granted by a Monarch in exchange for the provision of military service (funding or soldiery). The peasantry were obliged to exist on an aristocrat's land, provide labor, and to cede ownership

in technological innovation, along with the graduates disappearing behind corporate firewalls, because they, rather than the universities, are the institutions that can afford to do blue-skies research. It is a salutary lesson to visit the NASA Space Center in Cape Canaveral: the monument to human technological achievement is extraordinary. One learns that those Saturn V rockets were big, and those Apollo command modules were tiny; one also learns about how many spin-offs there were from the space program that made a substantial contribution to improving everyday life and well-being.

However, a trip round the site is punctuated by signs for the various *private* space companies, whose research can afford to be privately funded because they do not pay the tax that they should. This view comes with the accompanying realization that all of the spin-offs from these private space programs, built on a public infrastructure by publicly-educated individuals, are also going to be privately owned: truly this is techno-feudalism.

In the aftermath of the plagues in medieval Europe, the surviving aristocracy invested much effort in sweeping up the estates of their deceased neighbors, creating "Big Estates" that were too strong for central regulation and "too big to fail." In the aftermath of COVID-19, the same could happen with Big-Tech hoovering up assets, companies, and infrastructure. We need stronger governance and professional organizations like the IEEE to resist the rise of an analogous transnational techno-feudalism.

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In the aftermath of COVID-19, weak governance could allow BigTech to Hoover up assets and infrastructure.

of the production of that labor (and themselves). In return they received notional protection from roving banditry. By analogy, we could call techno-feudalism a socio-political economic system in which a Big Tech company holds sway over a particular domain of enterprise — search, ecommerce, transportation, etc. — as granted by an elected government, in exchange for political and financial support, and post-parliamentary career support. The rest of us, the info-peasantry, are obliged to exist within the asymmetric terms and conditions of the service: we provide the data in return for the service, but the aggregator (the platform owner) is the primary beneficiary. A particular risk for the info-peasants is the move towards cashless societies, accelerated by the specious post-COVID-19 argument that cash is a disease vector, potentially giving centralized control over what products a person is permitted to buy with a fiat digital currency.

We have talked before about the dangers of wealth extraction from local economies (14), and how ownership of infrastructure matters (15), if paying next-to-no taxation results