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The idea factory: Bell Labs and the great age of American innovation

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The idea factory: Bell Labs and the great age of American innovation by J Gertner; Penguin, New York, 2012, 432 pages, £18.49 cloth (US$29.95) ISBN 9781594203282

Try to imagine that we did not have a telephone network today—no cellular telephony, satellite communications, or modern computers. This is perhaps a familiar thought experiment, the starting point of so many ingenious works of speculative fiction. Now consider the fact that to imagine our modern age without the inventions developed at Bell Labs is essentially to pose the same thought experiment. This may give you some idea of their contribution to modern technology.

At a time when phone signals could be transmitted over only relatively short distances, when telephone subscriptions were expensive and only available to few, and when there was not yet a dial tone or ringer, Bell Labs was set up to create a vision for the future of communications. The Bell Telephone Company was founded in 1885—and, after a series of legal maneuvers, split into AT&T, a service provider, and Western Electric, supplier of all the equipment necessary to build and maintain the phone system. Almost from the start, these two companies were given the privilege of operating as monopolists in their respective domains. With their core revenue streams thus protected, the leadership was free to more fully consider the long-term trajectory of their businesses. How would, or should, the phone system look one, two, or three decades hence?

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可以充分考虑
长期发展轨迹

The Idea Factory weaves a narrative around a handful of the Labs's most influential innovators and administrators—a narrative that confronts important questions about innovation. Perhaps the questions do not require that we contemplate quite so radical a proposition as a world without modern electronics; such a counterfactual history is not entirely believable after Gertner has offered so many examples where the initial breakthroughs happened somewhere other than Bell Labs. On the contrary, *The Idea Factory* suggests that we may safely leave the world without modern electronics in the hands of imaginative fictionists. Our challenge is instead to imagine a more slippery counterfactual in which, instead of a monopolistic private laboratory, one had promoted some other model for encouraging innovation. Three main points emerge from Jon Gertner's account to help us.

Firstly, Bell Labs was protected by two forms of monopoly—the telephone monopoly and patents. This allowed them to extract rents far exceeding those necessary to provide the benefits associated with their research and services. Indeed, investigations by the US Department of Justice showed that the telephone company was abusing its monopoly power to charge excessively, and the Labs eventually decided to license all of their patents for free or for nominal sums to US companies, suggesting that the intellectual property protection had perhaps been a windfall all along.

因为垄断
他们收取的远远超
过所必需的资金

Secondly, as soon as Bell Labs began facing competition in its peripheral activities—for example, computing—evidence quickly emerged that Bell Labs sometimes failed to recognise technological opportunities; they invested heavily in an ultimately doomed alternative to fibre optic cables, and completely failed to realise the opportunity and value of integrated circuits.

贝尔实验室有时未能认识到技术机遇，一和别人竞争就完了

Thirdly, the protected status allowed Bell to reap financial rewards and to become one of the few authorities on communication technology, both assets being leveraged to gain influence in government and to protect their future revenue streams. As numerous stories in *The Idea Factory* make plain, this influence manifested itself in part through Bell Labs's advocacy for and assistance in growing the Cold War surveillance state, a trend that doubtlessly benefited the monopolist. 还是垄断 贫富差异加剧

There is nothing in the above list that adds to the catalogue of theoretical arguments about the costs of monopoly. The reason to read *The Idea Factory*, and I do think it is a good reason, is rather that it endows these abstractions with substance. Theoretical arguments might inform us about the *nature* of the costs of monopoly, but only an example allows us to appreciate their *magnitude*. 如果没有贝尔实验室, 这些发明还会被人发明吗

It is possible that Bell Labs delivered somewhat faster or better technological progress, but *The Idea Factory* recounts enough independent discoveries and missed opportunities 独立发现和错失的机会 at the Labs that we may quite easily imagine a counterfactual history where much of this progress was achieved by alternative means. On the other hand, it seems less straightforward to construct a counterfactual account in which small competing phone companies, or physics and chemistry and engineering departments at universities, could have extracted large rents from consumers, prevented competition from better technologies, or exerted a powerful influence to ease the drift towards the modern surveillance state. Perhaps this is an oversimplification, and one might insist that I have understated the social benefits of operating Bell Labs. This is a welcome challenge, however, because it would be the start of a debate that is necessary to inform collective decisions about how our society should encourage innovation. Bell Labs represents one particular answer to the question of how to balance the countervailing forces of monopolisation and innovation; universities, government agencies, and small private companies offer different answers. We need to understand the costs and benefits of each model before we can select a set of strategies that strike the appropriate balance.

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