Who rang the changes? User creativity vs. intellectual property in early telephonic imaginings

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Patent history vs. user history

- Patents and users two major research themes in history of technology, esp in telephone history.
- But literatures barely speak to each other
- Patent history focuses on documented principle of originality in *design*
- Evidentially rich and amenable to powerful analytical tools of business history
- User history focuses on originality in *usage*
- Places social constructivist emphasis on user discretion, but past evidence typically elusive.
Telephone history as case study

- Classic example of strong and comprehensive patent claims: inventors painstakingly protected their IP.
- Thoroughly tested and documented in litigation, e.g. Gray vs. Bell over priority on 14 February 1876.
- And strong user roles in changing patterns of usage
- Michelle Martin/Claude Fischer: female rural users in North America construct intensive conversational usage in 20th century (against supplier preference?)
- Jon Agar: teenage users discover and exploit text-messaging facility in 1990s, not planned by designers
- Ironic return to telegraphic origins of the telephone?
Conflict or mutual disengagement?

- Does patent history necessarily trivialize consumers?
- Does user history necessarily neglect design issues?
- Or autonomous domains, patent-holders and users generally disengaged?
- 1) Patents underdetermine the design of a specific device (Pinch & Bijker)
- 2) Design of a specific technology underdetermines the modes of its usage (Pinch & Oudshoorn).
- Patents doubly underdetermine usage of a device
- Only in 20thC do patents seek to specify exhaustively all possible usages (but even then not guaranteed)
- Patent holders only control over users the terms of the licensing agreement on hired/loaned equipment
Bringing the approaches together

- Patent-holders, manufacturer and users all contribute to the continual process of (re)invention
- Users’ crucial role: they “complete” the process of invention by inventing usages, giving device identity.
- Usages unforeseen by patent-holders and designers have significant cultural/economic benefits for them.
- User history interpretively multiplies inventive agents
- Past strategic patent-holders sought to multiply uses?
- Even if telephone users need not care about patent-holders, patent holders need to care about users!
- Rethink telephone’s arrival in Britain, as being more than just conversational device.
Be it known that I, ALEXANDER GRAHAM BELL, of Salem, Massachusetts, have invented certain new and useful Improvements in Telegraphy, of which the following is a specification:

In Letters Patent granted to me April 6, 1875, No. 161,739, I have described a method of, and apparatus for, transmitting two or more telegraphic signals simultaneously along a single wire by the employment of transmitting instruments, each of which occasions a succession of electrical impulses differing in rate from the others; and of receiving instruments, each tuned to a pitch at which it will be put in vibration to produce its fundamental note by one only of the transmitting instruments; and of vibratory circuit-breakers operating to convert the vibratory movement of the receiving instrument into a permanent make or break (as the case may be) of a local circuit, in which is placed a Morse sounder, register, or other telegraphic apparatus. I have also therein described a form of
Bell’s claims to originality in USA

- **1876**: “A system of telegraphy in which the receiver is set in vibration by the employment of undulatory currents of electricity”
- Three techniques of generating undulatory currents: electromagnetic induction, variable resistance & battery
- “The method of, and apparatus for, transmitting vocal or other sounds telegraphically… by causing electrical undulations”
- **1877** Second US patent: “Improvement in Electric Telegraphy”. Specifies construction and operation of Bell’s “electric telephone”.
- But no prescriptions about context or mode of usage
The electric telephone in use 1877

↑ Bell as user

← Modified telephone design with movable earpiece.
First UK patent 4765, ‘Electric Telephony’ 9th December, 1876

- Submitted by Bell’s London agent, William Morgan-Brown, between first two US patents
- Combines elements of both US patents, and first picture of box telephone in patent.
Bell’s modesty on Patents and inventions in Britain, 1877.

- Bell did not claim to be the inventor of the telephone – only first to transmit/receive comprehensible speech.
- Cited Wheatstone & Henry’s musical precedents in lecture ‘The Telephone’ to Society of Arts London
- Lecture to Society of Telegraph Engineers, London admitted his circuit arrangements “extremely similar” to proposals by Varley (London), Gray (Chicago), La Cour (Copenhagen), and Edison (Newark).
- Authorship of telephone somewhat over-determined but its usages somewhat underdetermined
- William Preece, President of STE, “it is impossible to say what this infant which I hold in my hand may in future bring forth.”
Bell’s appearance the highlight of British Association for the Advancement of Science Plymouth, 1877

Lecture on the telephone at the Mechanical Science section attracted a huge public audience.

Told of troubled development of device from musical communication to speech: the “articulating telephone”

Times (London) reported Bell’s speech August 22: “…What ultimate form it might yet assume he did not know. He did not bring the instrument before the Association as a perfected invention, it was yet only in its embryo state... Experiments and investigations are still going on.”

Inviting audience to speculate on future form/usage?
Journalistic responses to the ‘embryo’ telephone
Some chauvinistic and nationalistic themes…

- The best guarantee for the future of the Telephone lies in the extremely modest claims put forward on its behalf by its inventor [sic]. Professor Graham Bell - who, but the way is a Scotchman, and not a Yankee - would probably be the last man in the world to claim for his invention even the possibilities with which it has been connected in the fertile imaginations of American journalists [long-distance calls]. He frankly admitted to his audience at Plymouth that his invention was as yet only in its embryo state, and that he could not tell what form it might ultimately assume.

- ‘Oral Telegraphy’, The Times, September 19, 1877;
“Oral Telegraphy”, Times Sept 19 1877

“...the dream that the telephone may one day supersede the Wheatstone method of communication”

Much journalistic interpretation of the possibilities by the Times editorial team.

e.g. Usage as extension of the telegraph likely to be a very complex matter
But *Times* editorial soon projects the portable telephone.

Subject to improvements in both the telephone and human skill in listening and speaking with it…

“A time is coming when everybody, we presume will carry his own Telephone about with him. Wherever he goes he will be apply to step into a telegraph office, apply his own wire to the public wire and hold a private conversation with a wife, or a son, or a customer, or a political friend, at the end, without the intervention of a public servant [viz. telegraph clerk].

“A great change has come over the conditions of humanity” *Times*, November 19, 1877.
George du Maurier of Punch imagines future telephone usage: channel-hopping the piped opera?

Punch Almanack for 1878 (December 14 1877)  
*Musical Mistress of House* ("on hospitable thoughts intent").  
"Now, recollect, Robert, at a Quarter to Nine turn on 'Voi che Sapete' from Covent Garden; at Ten let in the Stringed Quartette [sic] from St James's Hall; and at Eleven turn the last Quartette from 'Rigolletto' [sic] full on.  
But mind you Close one Tap Before Opening the other!"  
Buttons. "Yes, Mum!"
1881 Clement Ader’s patented Theatrophone

Contemporary US song “Wondrous Telephone”
You stay at home and listen
To the lecture in the hall
Or hear the strains of music
From a fashionable ball!
By the Telephone Sound is converted into Electricity, and then by completing the circuit, back into sound again. Jones converts all the pretty Music he hears during the Season into Electricity, bottles it and pops it away in Bins for his Winter Parties. All he has to do, when his guests arrive, is to select, uncork, and then complete the Circuit. And there you are!
A challenge to traditional telephone historiography

- UK much slower than US in adopting this usage; Charles Perry: “The British experience 1876-1912…. the years of delay”.
- BUT: with highly effective mailing and messenger systems who needed the telephone? (Asa Briggs)
- AND: who needed stress of conversing with intrusive and opportunist unseen strangers? (Carolyn Marvin)
- But diversity of imagined other usages in 19th century (and 21st century) prompt investigation of actual deployment outside Bell’s conversational framework.
- Who else needed the telephone, what for and why?
- How much did this enhance Bell’s patent royalties?
The telephone for non-conversational leisure

- Theatrical toy usage, speech broadcast and opera broadcast well-known from 1877/78.
- Making telephones from kits a gendered boy’s hobby in the USA and UK from 1890s.
- Lord Salisbury’s, aristocratic electrician, used telephone c.1880- as on-off light switch to the dynamo shed on his estate.
- Mischievously perturbed visiting politicians with telephonically contrived disembodied voices in the Hatfield House lounge.
The early telephone as safety management device

- USA & UK 1877 - safety-oriented deployment of it in mining e.g. to report between mineface and surface.
- For reporting accidents etc, Bell’s articulating telephone easier to use than the telegraph:
  - “Its simplicity and the very low cost with which it can be applied [are] thought to render it specially applicable for such a rough and ready purpose as this, for it requires no more skill to use, or care to keep in order, than a speaking tube.”
- Journal of the Society of Arts, September 7 1877.
- Soon adopted by civic fire services too.
- And diving operations for communication to surface
The Bell telephone as surrogate testing galvanometer

- February 1878, George Forbes, Andersonian College in Glasgow, writes for Nature “The Telephone as an instrument of precision” i.e. sensitivity
- Telephone responded to very small currents with an audible click when galvanometer spots hardly move.
- Thus out-performs the mirror galvanometer in detecting transatlantic telegraph signals.
- September military application to testing of floating electrical discharge torpedoes by Captain C. McEvoy.
- Need to check state of electrical detonator line by weak electrical current without discharging explosive!
- Fits telephones to torpedos (Journal Society of Arts)
Many of these imagined or actual uses did not become mainstream speedily (over 100 years later)

But shows dangers of over-essentializing telephone’s functions

Importance of not just focussing on patents to do the history of a technology, especially not just patent holder’s vision of its future.

Strategic interpretive turn: avoid the 1970s whiggish functional presumption of de Pool et al. and turn it on its head.

Question 1: given all the other possible usages, why did Bell choose model of one to one conversational exchange as the canonical model of telephone usage – especially given non self-evidence of demand for this?

Question 2: How far do communications technology inventors knowingly or unknowingly rely on users to invent valuable uses (profitable or otherwise) for products incorporating their patents?