NETWORK SPIRITS

Conference organized at the Università della Svizzera italiana by Professor of Media Studies Gabriele Balbi and his collaborators Gianliugi Negro and Paolo Bory, as part of a series of unfolding activities within the Institute of Media and Journalism centered on the history of science, technology, and computing. The China Media Observatory hosted by the University, under the direction and care of Balbi and Negro, provided the rationale for a substantive focus during the conference on Chinese computer networks.

Sponsored by the Swiss Association for History and Computing, presided by Christiane Sibille; by infoclio.ch, the portal of professional historical research in Switzerland, directed by Enrico Natale; and the Swiss Academy of Humanities and Social Sciences.

Review by Vlad Atanasiu, Department of Informatics, University of Fribourg, Switzerland.

EMBEDDING TOPOLOGIES

The picture on the left shows Europe's fastest supercomputer in 2017, "Piz Daint" of the Swiss National Supercomputing Centre (CSCS), situated in the city of Lugano, on the southern slopes of the Alps. The rumbling emanating from the machine is not much different from that of an ancestral mill, only that it is not wheat or corn, but digital data that is crunched at the rate of 25 Petaflops. The data arrives and departs through 100 Gbit/s optic fiber cables set over the mountain passes of St Gothard, Simplon, and St Bernardino, serving academic institutions spread throughout the country, the CERN — cradle of the World Wide Web — at the French border, and various customers in the wider world.

The physical topology of the modern network thus closely follows that of 2000 years old Roman roads, themselves paved over neolithical trails. As for the excentric location of the supercomputing center, at five to seven train hours from the principal Swiss cities, such as Berne, Geneva, and Zurich, it is due to the battle of Marignano in year 1515. Having conducted during the 15th century crushing military campaigns against the German Empire to the North and the Burgundians in the West, the Swiss expansion into Italy was stopped by the King of France, François I, near Milan, about an hour drive from Lugano. In view of an equitable distribution of ressources between the four linguistic areas of modern Switzerland, a political decision was taken by the federal state in 1991 to allocate the newly to be established center for supercomputing to the Italian speaking canton of Ticino — that territory conquered 500 years ago.

The place is appropriate from a further point of view, namely that of the beautiful Lake Lugano. As it happens, the center consumes up to 11 Megawatts, in the future possibly even 25 MW, for suppling energy and cooling "Piz Daint" and the other, older, supercomputers. The necessary water is pumped from the nearby lake in 45 meters depth at the conveniently low temperature of 6 degrees Celsius and spilled back at 6 meters depth and no more than 25 degrees. On one hand digital Switzerland is hence taking advantage of the plate tectonics that eons ago created the Alps and the passing of the glacial era that dotted them blue with lakes, while on the other hand the circular water dynamics set in motion by the needs of supercomputing is sus-

pected, so the CSCS, to help rejuvenate the biotope of the heavily polluted Lugano lake.

Switzerland is a beautiful country and roundabout detours, through its picturesque countryside or intruiging history, should be refreshing and instructive. For example, for the purpose of introducing a seminal theme of the conference reviewed here: the realization of how much modern computer networks are tributary of preexisting topologies. From "longue durée" factors to events of the immediate present, from global trends to local particularities, physical networks and networked virtual worlds are embedded in a spatio-temporal scale-space topology; one that is also cultural, dominated by such dimensions as language, mentalities, and power. It might be useful to conceive these topologies as the spirits of the network, in reference to the Roman "genius locii" or the "sprites" of folktales and computer games, which albeit invisible factor into our lives. Let us listen to their signals.

The role of historians, journalists, and other inquisitors of the human mind and society, is to make the invisible visible, and in this respect the conference participants have succeeded in collectively creating a marvelous kaleidoscope of technological history. The following texts highlight a specific aspect of each presentation from the perspective of the reviewer, as a teaser for the forthcoming proceedings to be published in 2019 by the Swiss Association for History and Computing.

IMAGINATIONS

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INTERNET METAPHORS

"Chinese! How far are you from the Information Highway? 1500 meters Northwards!" Thus prodded a Peking billboard in 1995 people towards one of the first public Internet access points in the country.

The Chinese word for information, xìnxí 信息, is a compound of two ideograms with the semantic fields of "letter", "true", "believe", and "news", "interest", respectively. Thus Information Highway could be understood as positively connotated, a true path (Tao in Buddhism) towards enlightment (Zen). This is at least how the Californians saw things when the first APANET connections were established between the sunny beaches and the snowy Utah mountains. Alas, while the surfers might enjoy the scenery, where the road winds up is not in their hands. Governments throughout world history have been keen to control the strategical assets that are road and communication networks and convince the populations that the services they offer are not "fake news". The Chinese writing system, much more than Indoeuropean etymology, makes the double sidedness of Internet metaphors almost physically present. That metaphors are shaping how we think — George Lakoff's famous thesis — is self-evidence in Chinese politics. Let us move along this line with a couple more examples from Hu Yong's conference presentation.

In Imperial China the government was located at the Heavenly Peace Gate, or Tienanmen, a proximity to the heavens facilitating its power to "make rain and fine weather" (as Conrad expressed unfettered power in Heart of Darkness), in other words to decide if the "Cloud" of computing is a fluffy, benevolent creature or a dark and menacing monster, which drowns you in the torrents of data with which you yourself feed its unstilled hunger of knowing everything about everybody.

The "Great China Firewall" is another great metaphor, in the spirit of Chairmen Mao's slogan "Anything foreign is food to us." The idea is that China has to adopt useful Western technology, but keep Westerners out and preserve its own mores. This attitude of the Middle Empire towards the peripheral world is deeply ingrained in its millennial history and made tangible through the Great Chinese Wall, supposed to defend against the Northern Barbarians — who despite it managed to rule the country, as Mongols

(1271—1368), then Manchus (1644—1912). Westerners came from the sea, were there was no wall,
a situation that should not be repeated in the
case of the open frontier of cyberspace, hence
the rush of the Chinese dragon to build a digital wall of fire around its dominion. The pyrotechnic filtering technology is of course Western
export ware, but adapted to Chinese Communist
ideals.

Hu Yong / Peking University / The metaphoric Chinese Cyberspace:
The highway, the wall and the cloud
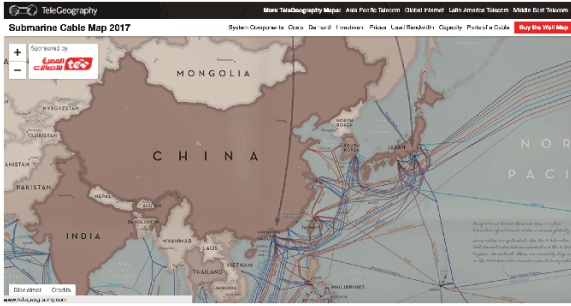
CYBER-SOVEREIGNTY

Words such as cyberspace, website, portal, and Geonames attest to how fundamentally online activity is conceived of in spatial terms. It is a small step therefore to translate concepts from the physical to the virtual world, such as "sovereignty". Clément Renaud and Grégory Bahde reveal a consistent string of such analogies and their implications. Taking European history as an example, the Peace of Westphalia of 1648 — that put an end to thirty terrible years of religion wars — was an experimental laboratory for the modern concept of sovereignty and the practice of international diplomacy. We witness today a similar situation, in which states are probing the nature of cyberspace and how to deal with it in practical and legal terms. The reproduction in the virtual world of historical models is one method, exemplified by "cyber-pirates", autonomous entities sometimes acting on behalf of sovereign states. The term "cyber-mercenary" has not gained widespread traction, but a "Declaration of Independence of Cyberspace" was already proclaimed in 1996 by the Electronic Frontier Foundation (another spatial metaphor), and while short of openly declared "cyber-wars", state sponsored "cyber-attacks" have become the new normality.

Clément Renaud, Grégory Bahde / École Polytechnique de Lausanne, Université Jean Monnet St Etienne / From Davos to Beijing: The historical trajectory of the concept of sovereignty in Internet territories

TRANSBORDER DATA FLOWS

Sovereignty is defined by differentiation of a system from an environment, the sociologist Niklas Luhmann would contend. The resulting "border" raises the question of transborder data flows, addressed by Jinhe Liu, for contemporary China. From a historical perspective, China evolved from a first submarine telecommunication cable laid between the mainland and Taiwan in 1888, to eight backbone Internet cables in 2017, concentrated in Hong Kong and Shanghai, and ambitious plans for terrestrial links to the Middle East and Europe along the New Silk Road. The legal framework regulating data flows has become steadily more precise. For example, the 2016 Cybersecurity law stipulates that private data and data critical to national security and economy should be stored in China; while the State Council Information Office of the People's Republic of China declares in 2010 that "Within Chinese territory the Internet is under the jurisdiction of Chinese sovereignty." From these and other texts it becomes apparent how Chinese law is defining the boundaries of the virtual in terms of its embedding in the reality of physical cables and territory. Interesting questions arise from here, such as the possibility of a "200 nautical miles" of the Internet or "influence spheres" on the Web.
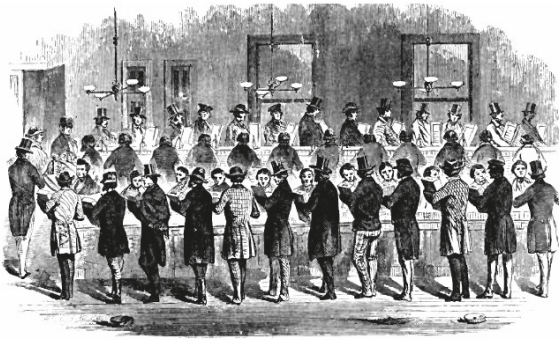

Liu Jinhe / Tsinghua University / Regime evolution of China's regulation on transborder flow of data: From 1994 to 2017

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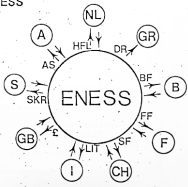ME
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LONGUE DURÉE PROCEDURES

Making the Exchange in Six Minutes, at the Clearing House.

Functionning of ENESS

The same procedure as given in the practical example applies for all members

The lithography on the left might look to an uninformed eye as a peculiar "rotary dance" performed by Victorian gentlemen. The mechanical computer pioneer Charles Babbage explains what is really going on in this depicture of the New York Clearing House from the middle of the 19th century: "At five o'clock the Inspector takes his seat; when each clerk, who has upon the result of all the transactions a balance to pay to various other houses, pays it to the inspector, who gives a ticket for the amount. The clerks of those houses to whom money is due, then receive the several sums from the inspector, who takes from them a ticket for the amount. Thus, the whole of these payments are made by a double system of balance, a very small amount of banknotes passing from hand to hand, and scarcely any coin."

The diagram, as for it, represents the Eurocard Interchange System in the early 1980s. The similarities are not only visually striking, explains Sebastian Gießmann, but there is historical filiation between the procedures underlying the two financial merry-go-rounds. It is an exciting idea to think of even more modern technologies, such as blockchain, as algorithmic dances grounded in how humans think and act in the world (revisit Lakoff and Núñez's speculations on the embodied nature of mathematics in "Where Mathematics Come From: How The Embodied Mind Brings Mathematics Into Being").

Sebastian Gießmann / University of Siegen / Networking with/out computing? Remarks on the longue durée of networking practices

LONGUE DURÉE INFRASTRUCTURE
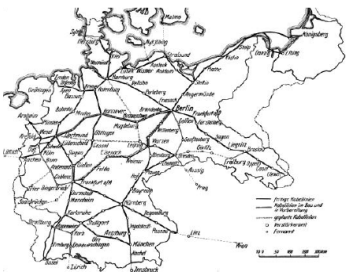
☞ Is this man a citizen benefiting from public service or is he a "customer", source of benefits for commercial telecommunication companies? This question is at the core of Christian Henrich-Francke's talk about the transition from copper cables to optic fiber computer networks in Germany. Since the early 20th century the country had one of the densest telephone networks in Europe, a legacy that contributed to various developments in the area of computer communication, such as the popular voice, video, fax, and data Integrated Services Digital Network (ISDN) and the interactive videotext system BTX of the 1980s, a cousin of the French Minitel. Much politics and economical considerations were poured after the German reunification in the 1990s on the transition to optic fiber and the opening of the telecommunication market. Especially on the so called "last mile" of the cables entering dwellings, the technological upheaval was experienced quite concretely by the population, subjected to month-long digging of streets, noise, and traffic diversions throughout the country. A more subtle change was that liberalization transformed the citizen into a customer and the telecommunication from a public service to a profit industry. What perdured after the monopoly of the Deutsche Bundespost ceased in 1995 was its power as a telecommunication regulator. As for the man in the flower shirt, he seems a happy inhabitant of the longue durée, juggling the vintage typewriter and the latest computer model.

Christian Henrich-Franke / University of Siegen / Computer networks on copper cables

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LONGUE DURÉE SPIRIT
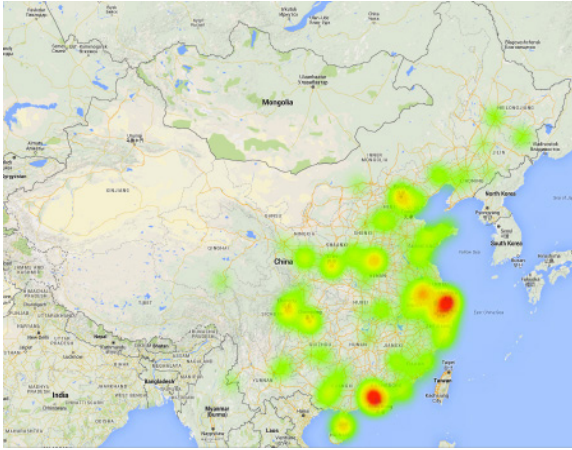
From a pirates den to a British colony to a
global financial hub and Snowden's hide, Hong
Kong has thrived as an enterprising melting pot.
It is not surprising that both it and another
former excentric colony where many worlds met,
Shanghai, had the highest number of FidoNet us-
ers in the late 1990s, as shown in the presen-
tation of Bo An. FidoNet is a Bulletin Board
System (BBS) of a special kind, not unlike its
logo dog, perhaps a crazy one. In the words of
Tom Jennings, its founder, FidoNet is "A large,
fully functional anarchism ... a communications
system built with personal computers, modems,
phone lines, and many thousands of crazy and
interesting people. It is run in a profoundly
casual manner. It is amazingly reliable and effi-
cient. There is no central repository for infor-
mation, no fixed structure to rely on." Given the
interest of the Chinese government to exert its
governing duties to their utmost extent, such a
manifesto is a fitting homage to the ancestral
spirits of the place and times where the BBS
blossomed in China.
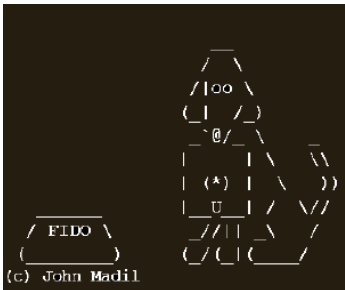
Bo An / Yale University / Infrastructure, amateurism, and radical
Networking: FidoNet in China (1995-1998)

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MACRO & MICRO-CLIMATES

Roberto Fano (1917-2016) descended from a distinguished Jewish Turinese family of mathematicians and physicists and his story, told by <u>Benedetta Campanile</u>, is that of the importance of macro and micro-climates for scientific research. As Europe was about to descend to the Hades of a second world war, Italy enacted the racial laws in 1938. Fano joined the brain drain before it was too late and arrived at the Massachusetts Institute of Technology (MIT), where he graduated in electrical engineering in 1941 and remained as a faculty member for the rest of his life. In this intellectually fertile environment he got involved in a great variety of projects, first on the war effort research on radar at the Lincoln Laboratory, then increasingly in information theory in collaboration with Claude Shannon and computing. In this respect he was a man of vision in a place of vision, pioneering time sharing of networked computers and knowledge-based computerized services for industries and the public. A child of the cybernetics era and cradle — Norbert Wiener was also at MIT —, project MAC was Fano's "grand folly" of nothing less than machine aided cognition and an Intergalactic Computer Network. It harnessed such minds as those of Marvin Minsky, J.C.R. Licklider, & John McCarthy and the philanthropic funding of DARPA. From this ferment, far from Rome's ruins, emerged the famous ARPANET and MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL).

Benedetta Campanile / University of Bari / Robert Fano, an Italian computer scientist from Project Mac to Internet

fig.2

RHYZOMIC GROWTH
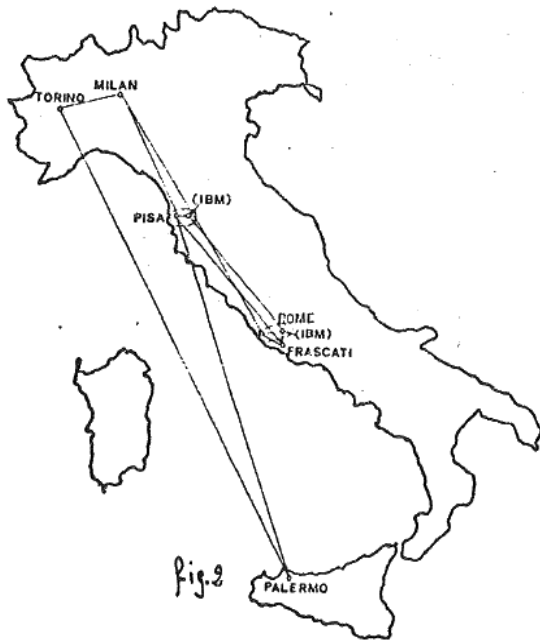
Pisa is of towering importance for the history of the Internet in Italy. Its growth is due to the collocation in the town of the National Computing Center for Electronic Calculus (CNUCE) and an IBM scientific center, which donated CNUCE in the late 1960s a 7090 IBM computer, valued at about 50 millions in current USD, through the Marshall Plan for the post-war reconstruction of Europe. This collaboration also involved the fabled BBN computational analysis and networking company of Cambridge, Ma., and resulted in the 1970s in the first Italian computing network (RPCNET), in the early 1980s an European satellite-based network for high-energy physics (STELLA), a US—EU satellite network with military components (SATNET), which resolved into linking Italy to the ARPANET and ultimately to the Internet in the 1990s. This evolution was anything but deterministic, explain Luciano Lenzini, Giuseppe Lettieri, and Fabio Gadducci: much is the work of individuals, such as Lenzini fighting for the projects and Robert Kahn, director at DARPA, being magnanimous, and the Italian bureaucracy doing its own job of procrastination.
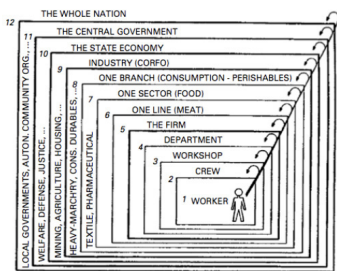

Luciano Lenzini, Fabio Gadducci, Giuseppe Lettieri / University of Pisa / On the Italian pioneering network projects: issues and challenges
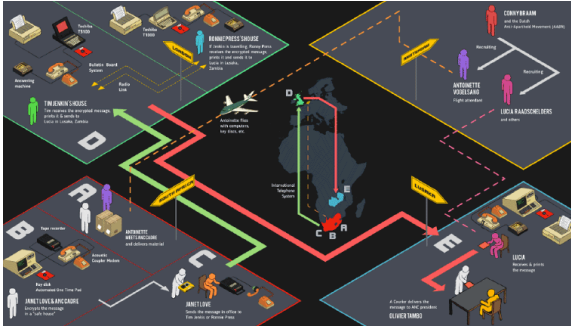
DISOBEYING NETWORKS

The history of computer networks is often particular to a place, as it became apparent with each passing presentation in the conference; but one thing they seem to share: "Networks disobey their designers!", said Benjamin Peters, veering between a legal finding and a revolutionary manifesto. As proof was offered a comparison of three case studies: the USSR, Chile, and the USA. The Soviets had a good head-start in the 1950 to build something like the "Internet archipelago", with accomplishments such as the Sputnik satellite and Gagarin's space travel, but due to bureaucratic and political squabbles, nothing came out of the supremacist sounding 1960s OGAS: the All-State Automated System for the Gathering and Processing of Information for the Accounting, Planning, and Governance of the National Economy, USSR. Meanwhile in Chile, the socialist government of President Alende arrived so far with designing as to have the Star Trekish control room of their version of cybernetic control of the society actually build. Once again, the future of the network was not to be what it was planned, General Pinochet and the CIA putting an abrupt and bloody end to the experiment. The only successful network was that of "capitalists acting as communists": the American ARPANET was organizationally a rather top-down enterprise, resulting in a rather tree-like network. So much for state ideologies and actual behavior...

Benjamin Peters / University of Tulsa / The network and the historian: opportunities, challenges, surprises, disobedience

1985 2015

WHERE NETWORKS ARE DISCOVERED

"It's the man who makes the place" say Romanians, meaning that places are what the humans make out of them. This applies well to the gentleman in the picture, an early user of Bulleting Board Systems (BBS) of the 1980s Brazil, an engineer involved with the first Internet connection in Brazil, now working for IBM, and a pioneer of the history of computer networks in Brazil. Marcelo Sávio de Carvalho was distraught to read in the "complete ... directory of specific networks and conferencing systems worldwide" published in 1989 in the US, that "there are no known networks in Brazil" and set out to unearth Brazil's network history. Besides his "I was there" first-hand knowledge of various technologies, events, and people, he found that there was already in 1973 a networks seminar in Rio de Janerio and even Vinton Cerf himself was present in 1975 in São Paulo to demonstrate a satellite link via Rio to New York. Brazil was under military dictatorship from 1964 to 1985 — another echo of sorts between it and Romania — so that except for banking and airlines, international communication and scientific networks were out of question; the abbreviation of the state's Sepcial Secretariat for Informatics was tellingly SEI, or "I know" in Portuguese. After the return to democratic rule the reconstitution of the civil society was also helped technologically, through means such as the Alternex BBS, created by former political prisoners, exiles, and others for the NGO Institute of Social and Economic Analysis. During that period, the late 1980s, the Brazilian Internet went through an interesting network-topological quirk state, three distinct subnets communicating only through nodes situated outside the country. Now the day has arrived to write its history, which the regional Symposium on the History of Informatics in Latin America and the Caribbean (SHIALC), presented by Lucas de Almeida Pereira, Paul Carnota, Marcelo Vianna, and Alberto Jorge Silva de Lima, is accomplishing biannually since 2010.

HUMAN-MACHINE NETWORKS

A microhistory study undertaken by Sophie Toupin revealed the South African peculiarity of networks in the context of Apartheid. For communication purposes between members of the African National Congress (ANC) in South Africa and its exiled leaders in Zambia, the following convoluted system operated from 1984 to 1988: A courier, Antoinette, flow materials such as computers, modems, and encryption software from the Netherlands to South Africa; outbound messages were encrypted using one-time pads, played through a modem into a telephone, and recorded on a tape recorder in a safe house by Janette; the tape was taken to an office or a public telephone booth and the encrypted audio message played over international telephone lines to the phone number of Tom in London; the signal was decrypted, printed, and sent to Lusaka, in Zambia, were the receiver, Dutch anti-Apartheid militant Lucia, brought it in person to the president of the ANC, Olivier Tambo. For networks history a valuable aspect of this system, besides its role in historical events, is its heterogeneous nature: geographically it involved four countries; communications were channeled through telephone lines and human couriers; signals migrated from oral to written to digital to audio media and back; messages existed in plain and encrypted form; participants were black and white people, women and men, of different nationalities. The network was, in the literal sense, at the infrastructure and protocols level, a hybrid human-machine network.

Sophie Toupin / McGill University / Hacking Apartheid

BRIDGES NO MORE
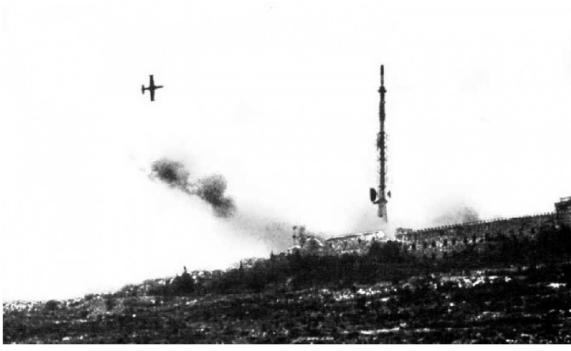
ARPANET, the military precursor of Internet, was designed specifically to remain operational in case of partial destruction, so that like water in communicating vessels, signals can still flow within the network. The history of computer networks in Croatia, retraced by Mato Brautovic, is a case study for such a design concept. During the communist era, Yugoslavia, of which Croatia was a federal state, was politically at the intersection of East and West, sending many "guest workers" to Western Europe and generally having more intense economical and scientific exchanges with the West than could wish its socialist brothers. The permeability of the Yugoslav Iron Curtain resulted in such developments as a computer link between Zagreb, Croatia, and Milan, Italy, students studying computer science in the West, and ad hoc imports by private persons of computers and communication hardware — most notably Commodore 64s and Spectrum ZXs during the 1980s — leading to a buildup of local capabilities and the first national computer networks. Their topology had repercussions on the War of Independence, 1991-1994, against the Yugoslav state, with its center in Begrade, Serbia. The international gateway of the network went through Slovenia to the Austrian Academic Computer Network (ACONET). The Solvenian authorities thus had the opportunity to sever Belgrade's link to the world, despite that it deprived the population of non-governmental information and strengthened the impact of president Milosevic's propaganda. The physical infrastructure of communication networks was targeted during the war and hundreds of centers, relays, and cables were destroyed, damaged, or held occupied. The objective of the destruction of the physical world — the iconic image of the broken arch of the Mostar bridge in Bosnia-Herzegovina comes to mind — was the destruction of the mental network that existed between the people of former Yugoslavia.

Mato Brautovic / University of Dubrovnik / Origins and development of Internet in Croatia: times of transition from communism to democracy and war for independence

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UNIX SPIRIT

The language of any two people living on the opposing sunny and shady sides of a valley is bound one day to diverge into two dialects. It is thus not surprising that history supplies us with a colorful string of social groups in which technological esoterism is expressed as cultural eccentricity — if it is not rather vice versa. One might think of the medieval masons & "compagnons du devoir" and their rituals, of Dada and its extravagant happenings, and, why, of the strangeness of mathematicians, like Paul Erdős, who was a one-man-culture in itself. Universities were since ever a hotbed of pranksters, but during the 1970s America witnessed the emergence of the technologizied hacker, first subverting public phones, then inserting viruses in floppy disks. Computer networks allowed such like minded people to congregate in cyber-communities of geeks and nerds, described by the creator of the Bulletin Board Sytem FidoNet, Tom Jennings, in a tellingly titled article of 1990, "Are all sysops criminals?", in the following terms: "The FidoNet is nothing if not contradictions — independent, unpredictable, paranoid, decentralist, self-sufficient, flexible, reactionary, technically sophisticated ... some wonder how we get anything done. I wonder how anyone ELSE gets things done!" The operating system Unix (*1969-) was the catalyst of many user groups throughout the world, which met both in person and online. As Camille Paloque-Bergès and Gerard Alberts tell it, Unix user culture was characterized by "styles of programming, software development methods, distributed software environments; hands-on computing, pragmatism, open code, versioning of software; anti-authoritarian ideology infused in autonomy, freedom, criticism, self-derision; and story-telling and reflexivity, heritage building". On the Linnean chart of computer networks they might well be the ancestors of the later day Wikileaks & Anonymous cyber-militants and descendants of an earlier François Villon, damned poet of coding, Till Eulenspiegel, irreverent system administrator, and Robin Hood, social activist.

Camille Paloque-Berges, Gerard Alberts / Conservatoire National des Arts et Métiers, University of Amsterdam / Beyond the protocol wars: 1980s user cultures in Dutch internet nodes

NETWORKED MODERATION

While recently checking the New Yorker website during an unexpected service downtime I was served a cute cartoon with the legend "Quick, Lassie, go get I.T.!" as a way to keep me in good mood (and it did work so well that I report the incident in this review). The question then to ask is what is the history of the moderation of computer networks, since obviously the term implies networks of both technologies and people. Kevin Driscoll sets out to find answers, contending that Bulletin Board Systems (BBS) were "sites of experimentation in community moderation". Phase 1, "Get Users", had to do with system operators (anything in-between amateurs, administrators, hosts, and entrepreneurs) recruiting users (e.g., by word of mouth, through free membership), verifying them (phone calls, post cards), and orienting them (at pizza parties, adults-only trivia nights, etc.). Phase 2, "Hold Users", had a technical component (administering time, data, and speed limits; BBSs operating in asynchronous mode and at low baud rates) and a social aspect ("encouraging conversation, defusing conflict, circulating files"). Phase 3, "Push Users", was meant to make the system inclusive (to the men-in-the-street, the deaf and the blind, the woman — and probably more, but we are still in the 1980s) and push the burden of responsibility from a single sysop (through "recognizing expertise, distributing authority, sharing ownership"). One take-home message from this analysis is that the human interaction developed through and around BBSs, the involvement of the users in shaping at least part of the technology, is what contributed to the nostalgic aura of a time when Alice and Bob were not yet "customers" of faceless corporations, but actually got to know each other and discover that they were not dogs on the Internet nor AIs.

Kevin Driscoll / University of Virginia / Thou shalt love thy BBS: A framework for the moderation of online communities

ASTERIX'S INTERNET

"If it ain't broke, don't fix it." Right, this is what French people thought about replacing the successful, tried & trusted Minitel with the emerging Web, providing Valérie Schafer and Benjamin Thierry with the subject for a study in shifting perceptions on the value of technologies. Minitel was a videotext service offered free of charge by the Post & Telecom French operator to any customer in exchange of the printed phone book. Besides access to the phone directory, train schedule, and weather forecast, it allowed a variety of commercial services, similar to what is on offer today on the Internet, including the "pink" adult chat site 3615 ULLA. A proud French product, cleverly marketed, the Minitel enjoyed an excellent public image and became an archetypal household item, a lively activity medium, and brought good money to its promoters. The fact that it was clunky, monochrome, and slow only contributed to feel affection for it, its ASCII-art display and modem melody. The Web didn't enjoy this positive aura: it appeared at the dusk of the millennium like a conquering anti-Columbus from across the Atlantic ocean and demanded money and technical savviness to be of any use. This suspicious mindset was reflected in the paradoxical first cover of a Parisian magazine from the late 1990s supposed to promote the new technology, "Should we be afraid of the Internet?" (the answer was basically "yes"). So how did the transition battle unfold? Look at the advertisement for a reverse directory depicting a men making seaside sandcastles: it is a graphical representation of Minitel's demise, a slow erosion, unlike the Internet tsunami experienced by some other countries. Born in Brittany, the last Asterix-like holdouts of Minitel resisted until 2011, when it was still creating 10 million Euro of annual benefits at the time of its closing down.
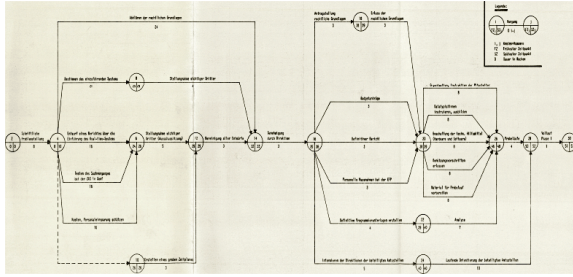

Valérie Schafer, Benjamin Thierry / Institut des Sciences de la Communication, Université Paris Sorbonne / The Internet and the Web as a "Super Minitel"

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THE ZAR OF SWITZERLAND

For most of its history Switzerland was an emigration country, as exemplified by the trademark images of Swiss mercenaries, confectioners, or Le Corbusier's architectural work. At the same time Switzerland is an quintessential safe haven, for French Huguenots, Victorian tourists, Lenin, and James Bond. Meticulous military, police, and bank ledgers keeping track of comings and goings have certainly existed before, but their extent is nothing to what became possible with networked computers. The economic boom of the 1960s was fueled by an influx of foreign workers, which the federal state wanted to record, analyze, and ultimately control (command?) in the true cybernetic fashion of those years. Thus took shape in the 1970s the Central Index of Aliens, known by its German acronym ZAR, first in analog media (paper formularies and inquires by letter, phone calls, or meetings), then increasingly as punch cards and later using magnetic tape storage and real-time terminal access technologies. The data was collected at municipal level throughout the cantons by the foreigners' police and stored in a federal repository; the social security number served as a key identificator. Besides its administrative function, these data were intended to aliment political decision making and economical planning; in other words to act as an intermediary between reality and the deciders. Perhaps also as a screen between endogenous and exogenous social bodies — unintentionally or unconsciously. The cold blooded remoteness of bureaucracy, especially chilling in its digital version, is well understood, but its propensity to corruption gets a fine example in a post-scriptum to the ZAR story, related by Guido Koller. In 1989 a parliamentary commission discovers that the Swiss Federal Police has illegally amassed, since around 1930, a staggering amount, hundreds of archival storage space, of index cards ("fiches" in French and Swiss German, hence the fishy "Fiche Affair", no pun intended) reporting on national and foreign persons and organizations in Switzerland, an unpleasant parallel to the similar activities of the East German Stasi come to light during the same period. The information on foreigners in the Swiss cards originated partially from ZAR.

Guido Koller / Swiss Federal Archives / Of men and register: The foreigner's central register in Switzerland — An early digital federal administrative network

MINITEL 2.0

Established in 1992, the French Data Network (FDN) is the oldest associative Internet Access Provider in France. The relevance of its history, retold by Félix Tréguer and Dominque Trudel, is that of the power play fought around networks between netactivist Davids and monopolistic Goliaths. FDN's philosophy is one of non-profit, exchange, and mutualization of resources — as well as culinary get togethers. It's founder, Benjamin Bayart, conceptualized the essence of Internet as an interdependency of three pillars: decentralized and neutral infrastructure, open source software, and a participative user community spirit. All these aspects are contrary and endangered by the former Minitel, the present Google, and similarly centralized systems. The largely futile struggle of FDN to shape the French Internet landscape according to its agenda is a case in point for brevity of the open frontier window that existed for the computer network regulation between the 1980s of BBSs and other anarchic Unix communities culminating in the lost of monopoly of historical telecommunication companies during the early 1990s and the rise of renewed corporate dominance and state surveillance from the late 2000s onward. All might not be lost, surmises Bayart, if the big historical picture is considered: movable type printing eventually defeated the manuscript, helping along the Reform dent the Pope's infallibility and the free speech of the French Revolution cross out feudal monarchy. In respect to our own immediate future, one might wish to point out that the former necessitated a thirty years war and the latter the Terror and the guillotine.

Félix Tréguer, Dominique Trudel / Institut des Sciences de la Communication, Concordia University / From internet access provider to political advocacy: the history of the French data network

Krištof Kintera (2009)
My light is your Life:
Shiva Samurai 5kw/50Hz
[Lugano in backgorund]

Shiva Nataraja

God Shiva
Creator and Destructor of Worlds
Your dance sets in motion waves through ether,
Alights particles of light
That weave Indra's infinite fractal net,
The growing web of synapses,
The Thinking Universe.
Dance!

India's place at the conference was foreshadowed
by an exhibition at the Lugano Art Center about
Europe's long fascination with the subcontinent,
in which Shiva occurred in several traditional
and modern artistic incarnations. The Supreme
Being is an apt metaphor of computer networks
and their impact on the world in general and In-
dia in particular. From a military and academic
engineers' project, Manushi Mansi drew the arc
of history that made Indian Internet an entity
with almost divine power over knowledge, edu-
cation, economy, politics, and geopolitics. The
linking of individual computers in a world wide
network is for humanity indeed nothing short of
the growing of an artificial planetary brain. May
Shiva keep dancing a propitious dance!

Manushi Mansi / Indian Institute of Mass Communication, New Delhi
/ Towards Digital India: Internet in India

COLOPHON