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ANTENNA

Newsletter of the Mercurians, in the Society for the History of Technology

Citizens (Band) of France Unite !
by Pascal Griset

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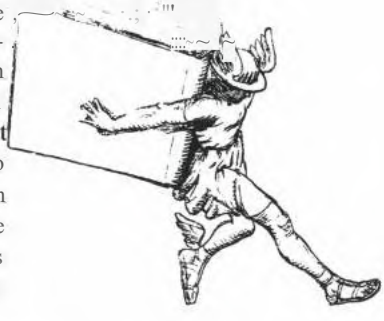
by Pamela W. Laird

Mercurial Matters:

With more than a little ambivalence, I set aside the "editorial we" for this column. When putting together the November 2001 issue, I realized that ten years had passed since I took over editing and publishing *Antenna*. Those ten years, plus the previous years of overseeing with Lori Breslow the hearty group of graduate students producing the newsletter at the Armenberg School of Communications at the University of Pennsylvania, plus I hope some continuing usefulness, have developed wonderful and precious ties, both professional and personal, with Mercurians all over the world. I have never ceased to be amazed when you send in your subscriptions and encouraging comments, many of you since the very beginnings-kind and kindred spirits, all.

It's time, however, for *Antenna* to benefit from fresh ideas and new ways of doing things. So beginning with the fall issue, Andrew Butrica will take over as editor and publisher. Andrew has been a Mercurian from the start, and he began as *Antenna* coeditor in 1997. In addition to his enthusiasm and facility for roaming the Internet, his masterful editing skills have made it possible for me to continue my commitment to the newsletter. And *Antenna* has been much the better for his efforts.

With the able assistance of Dave Whalen as book review will, o~ course, need the connnuing support of Mercurians and their ideas. On an immediately practical matter, he also asks that anyone who would like to consider joining up as an assistant or coeditor please contact him. The news editor position is also open.



I will be stepping down as Mercuri ans chair as well. This means an election at the annual meeting this October in Toronto. Please contact me if you are interested in serving in this capacity, or if you would like to nonúnate or suggest someone else.

Thank you all for all the good years and support. Thanks also to the History Department of the University of Colorado at Denver for its generous support over the years.

Oh, yes. And just because I won't be reminding you regularly, don't forget that print is a communication technology, too....

Pam Laird

As always, we most wholeheartedly thank Pam Stephan for her hard work at building the <MERCURIAN.ORG> website and maintaining it. Contact her at <PSTBPHAN@CENTURYTELNET> with suggestions and comments. Or send ideas to Pam Laird.

Business matters: If you received a remittance envelope with this mailing, your subscription and membership end with this issue. Please see page 12 for renewal information. Thanks to all of you for your continuing interest and support. And thanks, again, to SHOT and, for the last time. to the University of Colorado at Denver for their support.

SHOT 2002 in Toronto

The Institute for the History of Philosophy of Science and Technology at the University of Toronto will host the Society for the History of Technology's (SHOT) 2002 conference, 17-20 October. The Mercurians will hold their annual meeting at a local restaurant during lunch on Friday. The SHOT summer newsletter will contain details.

The local arrangements committee has done a superb job of planning special events and tours to help conference attendees and their families enjoy this wonderful, cosmopolitan city. For details on the conference and Toronto, visit the SHOT website, <www.shot.jhu.edu/annual.htm>. The local arrangements committee has assembled there descriptions of Toronto's attractions plus suggestions and advice about getting along well and pleasantly.

Upcoming SHOT meetings:

- 2003 October 16-19 at the Sheraton Hotel, Atlanta, Georgia
- 2004 in The Netherlands

GRADUATE STUDENT BONUS!

Can you recommend a graduate student, not necessarily in the U.S., who might enjoy a free membership to Mercurians and a subscription to the newsletter? Thanks to the generosity of History Enterprises, Inc., we can offer three gifts of two-years' dues. Just send us (either Andrew Butrica or Pam Laird) your nominations, and the first three will receive this issue and two years' more. Any member can nominate any student.

History Enterprises, Inc., specializes in historical research and content production for a variety of media, as well as archives and information management for both corporate and nonprofit institutions. They can be found at <http://www.historyenterprises.com/>.

Survey of Local TV History

"Preserving Local Television" will survey local television collections in archives, museums, libraries, and even stations. The National Historical Publications and Records Commission (NHPRC) has recently funded the Association of Moving Image Archivists (AMIA) for this two-year project, which it will conduct in association with the National Academy of Television Arts and Sciences. One goal is to improve communication between archivists and broadcasters. The project will also develop guidelines for preserving and managing the extant products of local television.

The participants in this project ask anyone who knows of existing local television collections, regardless of condition or accessibility, to help them build their database. If you have any information, contact Karen Cariani, WGBH Educational Foundation <karen_cruiani@wgbh.org> with station call letters, city, state, repository, and (if known) contact person.

For further information on the Preserving Local Television project, contact Project Manager Sharon Blair at <blairsat@aol.com>. For the AMIA, visit -cwww.amianet.org>.

News of Mercurians and Their Projects

David C. Arnold, Major, USAF, is just about to complete his dissertation at Auburn University, "Supporting New Horizons: The Evolution of the Military Satellite Command and Control System, 1944-1969." He concludes that, like every large technological system, military or civilian, the Air Force Satellite Control Facility evolved because of the interaction of human beings with technology. The Air Force Satellite Control Facility did not simply turn out the way it did because the technology evolved autonomously. The U.S. Air Force purposefully built the Air Force Satellite Control Facility to support the National Reconnaissance Program. The Air Force Satellite Control Facility had a unique relationship with the National Reconnaissance Office, a secret organization that the government officially concealed into the 1990s. In the special relationship between the National Reconnaissance Office and the Air Force Satellite Control Facility, one sees a social construction of technology at the behest of a particular interest group most clearly revealed. Therefore, this dissertation will show the Air Force Satellite Control Facility evolved as a social construction, according to the Hughes model, solely to support satellite-based reconnaissance.

Richard F. Bellaver, with John M. Lusa, published *Knowledge Management Strategy and Technology* in January (Boston: Artech House, 2002). This resource details the techniques needed to identify, manage, control the flow, store, and share access to information. Utilizing real-world case studies and in-depth discussions, the book suggests ways to develop strategies for implementing programs to employ the power of knowledge, to create systems to make knowledge readily available throughout organizations, and to prepare directory systems that provide a source for locating and interacting with knowledge workers and automating the sharing of knowledge. The goal is an effective knowledge management policy that addresses technological, organizational, and process factors.

After retiring from AT&T, Bellaver became associate director of the Center for Information and Communication Science, Ball State University. He teaches courses in the history of information and communications, telecommunications management, strategic planning for information systems, human factors in technology, and knowledge management.

Cover: The larger (7.6 centimeters long) and more complex of two etched red ochre stones, found at the lower tip of South Africa, in the 77,000 year-old Blombos Cave deposits. See "Receiving Red Ochre," page 9. Courtesy of National Science Foundation. <www.nsf.gov/OD/LPAJnews/02/pr0202images.htm>

Hugh R. Slotten's *Radio and Television Regulation: Broadcast Technology in the United States, 1920-1960* has been getting some great press of late (Baltimore: Johns Hopkins University Press, 2000). A rave review in the *American Historical Review* (February 2002) includes phrases like "absorbing features" and "powerful documentation." Similarly, an online review for <EH.Net> in March, praised *Radio and Television Regulation* for its "detail about the nature and importance of the input provided to the Radio Commission and the Federal Communications Commission by engineers and the numerous disagreements among engineers and between them and non-engineers and the reasons for this conflict." *Technology & Culture's* review (January 2002) lays out Sletten's "central thesis [which] is that broadcast policymaking is shaped by a tension between what he calls technocratic and nontechnocratic perspectives." Mercurian Christopher H. Sterling also gives Sletten a positive reading in the *Journal of American History* (March 2002), emphasizing the "interplay between industry and government officials" evinced throughout the cases. Sletten focuses, in his own words, "on the intersection of technical issues and the social, political, legal, and economic components of decision making." In examining the introductions of AM, FM, and television, both monochrome and color, he hopes to help "illuminate the complex interplay between technical issues and such fundamental concerns as monopoly concentration, patent structure, and control of information."

Congratulations to Aristotle Tympas for completing his dissertation, "The Computer and the Analyst: Computing and Power, 1880s-1960s." This study of the historical relationship between electrification and computation focuses on the computation of the transmission part of an electric power network, which was the defining component of what came to be known as "power analysis." Power analysis was determined by the tradeoff between the pursuit of increased social profit by the lengthening and interconnection of transmission lines and the corresponding decrease of technical instability. Tympas divides the period under consideration into three sub-periods, and he finds that computing the stability of electric power transmission during these sub-periods was marked by the development and use of the artificial line, the network analyzer, and the mainframe electronic computer respectively. Other computing artifacts were used as well in power analysis, some quite extensively (slide rules), others relatively little (calculating-tabulating machines). Within a scheme of expanded reproduction of the capitalist mode of computing production, there existed continuity-c-ideological, political, economic-during the transition from local to regional and from regional to interregional electric power networks. Tympas studied under Steve Usselman at the Georgia Institute of Technology, and received fellowships from Georgia Tech, the IEEE, the Hagley Museum and Library, and the Smithsonian. He teaches at the Business School, University of the Aegean, Chios, and in the Political Science and History Department, Panteion University of Athens.

Citizens (Band) of France Unite

Starting in the late 1970s, a "new" technology took off in France: Citizen Band (CB) radio. The term, borrowed from America, denoted an uncomplicated, well known short-wave technology that was easy to use. In addition—and this was essential—people could communicate without the intermediary of an operator or a network infrastructure and-no less consequential—its use was free of charge.

Although the inherent mobility of the CB radio allowed users to escape control with relativeease, this freedom, io France at least, was superficial. Because it used radio bandwidth, CB was subject to the same regulatory framework and the same state communications monopoly as other uses of the radio spectrum. When CBs began arriving in France from the United States, the state neither had issued regulations specifically governing CBs nor had authorized their use. Consequently, users of CB radios were in violation of the state's monopoly, and, despite their small number, they did not escape the authorities' attention.

The Senfor Skyline 2010 was very popular in Europe, especially among early adopters. Produced in Japan, beginning in 1980, it had good reception on 22 channels.

This regulatory and legal paradox made the CB, more than the telephone, a notorious victim of the state's telecommunications monopoly, the subject of intense political debate between the Right and Left. Not surprisingly, CB use also was colored by rebellion and defiance directed toward the state. The portrayal of the CB user in popular U. S. movies and television shows imported into France bolstered the insurgent mystique of the CB user. During the 1990s, the CB took on a new life as it metamorphosed into a consumer product, one that marked lhe absorption of an American technology and practice into French popular culture.

The French public could not buy CB radios until L967. Initial sales were minimal and increased notably only with the importation in 1974 of the Midland CB radio manufactured in the U. S. In 1975, the first shop to specialize in CB equipment, Guy Mocquer, opened and sold the imported President brand. Although the radios were 30 to 50 times more powerful than the maximum power authorized by law, the authorities tolerated their sale and growing use, prosecuting only offenders who caused interference. CB excitement began to soar. From 1979 to 1984, the number of CB users increased forty times.

Several factors drove this explosion. U. S. firms, faced with a saturated market, launched a large-scale commercial offensive. Prices ranged from as low as 50 francs ($10 US) to over 3,000 francs ($600 US) for more sophisticated CB radios. In addition, the latest CBs featured more channels and greater simplicity of operation, as quartz tuners gave way to synthesized frequency circuitry.

The growing number of CB enthusiasts soon began to contest the state monopoly. Starting in the summer of 1979, the authorities increased the number of criminal prosecutions, and on October 29, 1980, they stopped all imports of 27 MHz radios. In protest, between 10,000 and 15,000 CB users assembled at the Le Mans motorbike racing track. CB importers and the Western Automobile Club, representing its 300,000 members, supported the protest. The CB movement was no longer a marginal phenomenon and soon played a key role in presidential elections.

One of the central electoral issues was the state telecommunications monopoly, The Left promised to ease restrictions and to provide users 100 channels. The government responded ou December 15, 1980, with standard NFC 92411, which authorized 22 channels and a maximum power of 2 watts (FM), subject to administrative authorization. Owners of older sets could continue to use them, but only on allocated frequency bands. The new rules galled CB enthusiasts.

The electoral victory of François Mitterrand opened an era of relaxed restrictions. On June 1, 1983, the govemment announced a new regulation permitting 40 channels, three operational bands (AM, FM, and BLU), and 4 watts of maximum power. Users would pay 170 francs ($34 US) for a 5-year license fee. These regulations eventually led to the CB's transformation in the 1990s into an everyday consumer good, though one whose use was confined to motorists.

A fresh spurt of CB growth took place after 1992. In a little more than a year, the number of cars with CBs doubled, and in less than four years the number of users tripled. Driving this dramatic rise was the introduction of a point system for drivers on July l, 1992. Professional truckersprotested by blocking the country's main highways between June 29 and July 10, 1992, just as the whole country was set to travel on vacation. Their protest showed the effectiveness of the CB radio in divulging police locations, and the CB promptly became a defense against police radar.

Other factors also drove the new buying wave. A statutory reform of March 31, 1992, essentially suppressed the license fee and all other formalities, while CB sales outlets expanded from the specialized stores of the 1980s, which continued to prosper, 10 mail order distributors, supermarkets *(hypermarchés)* and automobile garages and parts stores. Four importers of CB radios, manufactured in Asia and sold under U. S. brand names, shared the French market: President Elec-

Citizens (Band) of France Unite ! (continued)

cronies Europe, Dirler, Euro Communication Equipment (CB House), and CRT France International. The two largest importers, President and Dirler, held 40% of the market in 1995.

CB advertisements rarely mentioned technical performance, but stressed ease of use, comfort, innovative characteristics, aesthetics, and ergononúcs. The ads aimed at a mass market seeking a familiar consumer good and featured, for example, sets that combined the CB with a car radio or CBs that one could mistake for a telephone. Magazines also reflected the CB's transformation into a mass-market consumer good. CB magazines, such as *CB Connection., France CB,* and *Radio CB Magazine,* published between 25,000 and 40,000 copies monthly.

CB culture, like CB use, changed from the 1980s into the 1990s. The CB culture of the 1980s featured a spirit of rebellion against the state's regulations and monopoly and the absorption into French popular culture of an American technology and practice. The CB clearly was identified in France as an American product. Action films of the 1970s projected an image, albeit cliched, of the CB radio operator, and identified the CB with an America of open spaces, individual freedom, and the freewheeling world of the automobile. *Duel* (1971), *Smokey and the Bandit* (1977), *Out of the Blue* (1981), and *Convoy (*1978) glorified the mythical America of mobility, open spaces, and violence. *Convoy,* in particular, celebrated the power of the CB over police. Truck drivers eluded the corrupt police, rallied fellow truckers to their cause, and forced the police to give up, all thanks to the CB. *Convoy* helped to ingrain American CB culture firmly in a segment of the French population. It identified CB enthusiasts as at odds with the state monopoly, fiercely hostile towards the police, yet somehow not outside the law.

French television also propagated American CB culture though such popular series as *"Sheriff fait moi peur"* ("The Dukes of Hazard"). These tended to revive the myth of the TV Western and linked the CB to the freedom of the road, nonconformity, and defiance of the establishment, as well as to specific geographical areas, namely the U.S. South and West, with their appealing portrayals of a rural society still free of urban pressures. The individuals portrayed on television were neither marginal groups nor youth, but rather successful professional adults who refused to conform to a rigid societal framework. This image reflected the reality of the CB as a technology of the French middle class. Those with modest incomes, or lacking a car, or finding the CB too expensive, as well as those from the affluent classes who found the technology useless or too vulgar, represented only a very small number of its users.

French media portrayed a diverse spectrum of CB enthusiasts, from such cultural rebels as Serge Gainsbourg, Coluch, and Renaud, to rural TV hosts, such as Yves Duteil and Gérard Lenormand, to the populist and chauvinist Herbert Léonard. The CB also inspired musicians. For example, Dalida recorded "Confidence on the Waves;' and Jean-Yves Lozach sang "Channel 19," reflecting his commitment to the fight for freedom. One rock group even named itself "Citizen Band ..,

The social diversity of CB interest seemed to exemplify the claim that CB use crossed social barriers, because it allowed people to chat anonymously (using CB "handles") without any technical, regulatory, or tariff barriers. Despite the anonymity and brevity of interchanges, the CB created feelings of immediate complicity and liking based on an exchange between social equals. The use of *tu,* the informal French "you;' was the rule and signified the lack of social distance among CB users.

The CB, so popular during the 1980s and 1990s, seems somewhat antiquated today. It has no IP network, no digital telephone system, no optical fibers, and no satellites. Nonetheless, perhaps CB radio will become a model for the future. As mobile telephone and computer use expands, one wonders whether the CB—a mobile communications system by nature, autonomous, free of charge to use—will become the prototype for tomorrow's Internet.

Pascal Griset is professor of contemporary history at the University of Paris, Sorbonne. He is also Director of the Centre de Recherche en Histoire de l'Innovation. Most recen/ among his many publications is "Submarine Telegraph Cables: Business and Politics, 1838-1939," which he coauthored with another Mercurian*; Daniel R. Headrick,* (Business History Review *vol. 75, Autumn 2001).*

Truckers fantasizing about rallying together across the United States, using their CB radios to coordinate, were not the only people who made the song "Convoy" a #1 hit for C. W. McCall in 1975 and 1976. The Midland International Corporation then marketed a radio with McCalJ's picture on the box cover and his introduction to CB users· etiquette and jargon, reassuring novices that they dido 't have to be nervous about talking in public. The kit that came with the radio also included Federal Communication Commission (FCC) forms for applying for transmitring licenses. Visit the online Museum of C. W. McCall and Other Wild Places at <www. techren.net/mccall/museum/».

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Printing A Revolution?

When giants contest large questions, the ground shakes beneath them. Thus might the rest of us perceive the heated debate between Elizabeth L. Eisenstein and Adrian Johns in the most recent *American Historical Review* (February 2002). Eisenstein's two-volume *The Printing Press as an Agent of Change* (Cambridge University Press, 1979) shows that Europeans used printing presses in ways that created a cosmopolitan print culture and transformed their worlds and how they saw them. Johns's *The Natureof the Book* (University of Chicago Press.1998) argues, in part, that the notion of a print revolution did not arrive until around 1800 and that analyzing what came before that time requires detailed reconstruction of local practices of both printing and reading (his own work studies England). Assessing these two books, even just these essays, is impossible here. So instead, here are a few hints about the essays' contents to tempt you into looking into the *AHR* arena to witness this great debate.

Standardization is a theme that historians of technology take seriously, and it weaves its way through these essays. How and why did prints capabilities for standardized production appeal to those concerned with reproducing or reading bodies of words? To what extent did it fail to relieve concerns about reliably reproducing texts? Other questions Eisenstein and Johns address include how and why did print technologies and their uses spread? How did early producers and consumers of printed words experience the processes? What frustrations and satisfactions did they feel with it?

Eisenstein explains her disagreement with Johns in part as following from her own "start[ing] with medieval texts and the incapacity of hand copying to achieve certain goals long valued by Latin reading elites." In contrast, she says, Johns "starts with the modem book and the incapacity of the handpress to achieve the degree of standardization and uniformity that is now taken for granted." The authors articulate their contrasting historiographical methods, as well; most intriguing.

The centrality of print to most historical processes for the past seven centuries makes it difficult to isolate their mutually reciprocating causes and effects and to weigh relative impacts and influences. This *AHR* forum shakes the scholarly earth with its intensity and the excitement of debating just how and why this cluster of communication technologies came to matter so much.

Antenna readers will recognize Elizabeth Eisenstein as a distinguished member of the newsletter's Associate Board.

The End of Books

"It was in London, about two years ago, that the question of 'the end of books' and their transformation into something quite different was agitated in a group of book-lovers, artists, men of science and of learning, on a memorable evening, never to be forgotten by anyone then present."

Thus began "The End of Books" in *Scribner's Magazine* in August, 1894 (vol. 16, issue 2. pp. 221-231). It wasn't digital communication technologies that worried the "book-lovers" then, according to author Octave Uzanne. It was sound recordings that seemed to challenge print's viability and vitality.

You can find this evocative and wonderfully illustrated essay in two formats in the medium that some fear threatens print today. Karla Tonella has created an HTML version of the original article for the Obermann Center for Advanced Studies website at -c h It p: //www. uiowa. ed u/ –obermann/endofbooks/». To give visitors the benefit of seeing the dozen drawings from the article without having to wait for all of the article's pages to download, Tonella has created a web page just for them within the site. One of the most imagina tive drawings. "Reading on the Limited," depicts a passengaer train car full of well-dres sed Victorian men and women called the "Pullman Circulating Library." Each person sports earphones that look very much like today's all-too-common contraptions, except that these are hard-wired to portals on the side of the car.

In addition, Tonella offers an eclectic collection of recently updated links to articles both popular and scholarly, from a century ago to recent. Other links include the American Museum of Radio, the Dead Media Project. Inventing Entertainment at the Library of Congress, American Memory project, the Media History Project, and Tinfoil.com, which is "Dedicated to the preservation of early recorded sounds."

Tonella also provides a link to the second treasure trove for locating "The End of Books," the Cornell University Library's fabulous resource, Making of America, <http://cdl.library.comell.edu/moa/>. Searching for "end of books" here will take you to a location with the facsimile reproduction of the entire volume of *Scribner's Magazine* that contains this article.

Reading Red Ochre: Parting Thoughts on Mixed Receptions

There is nothing magical about shouting into a canyon. The magic occurs when the echo calls back to you. Sometimes we do talk or write primarily to express ourselves, but getting a response to an expression can amplify the rewards. We send so that others will receive; getting an e-mail is more exciting than sending one; imagining someone 's receiving our greeting cards gives purpose to our agonies of selection. These are distincùy human processes–rich with abstractions, not reflexes.

As I thought about writing this "farewell address," message reception phenomena kept coming to my attention, from stone age technology to DSL. You may recall the excitement generated by a report about what may well be "the oldest known art" *(Science,* 11 January 2002). The art, two pieces of red ochre from the southernmost tip of Africa, is clearly and deliberately engraved, as the picture on our cover shows. What is not clear, of course, *is* what they meant to their creator. Yet, they are certainly a product of "human behavior" with no clear practical purpose other than either communication, expression, or "doodling," as one analyst suggested. Even so, these etchings, 40,000 years earlier than the famous Late Stone Age paintings in France and Spain, tell us several things, although perhaps more about their receivers than their creators.

Antenna readers will not be surprised that the stones· discoverers excitedly claim these to be the "earliest" known examples of humans' non-functional designs. Their attribution of "symbolic representation" to these stones seems to reward their seven years of digging. The general excitement over these small artifacts confirms the attraction of another Mercurian passion, as well, namely studying the histories and technologies that result from the urge to communicate. How long will we speculate about whether they hold a pwposeful message?

About the same time as the ochre stone story was in the news, my husband and I participated in our own contemporary drama after succumbing to the sirens· call of DSL. Or was it the temptation of Mephistopheles? For over a month, and spending at least 30 hours with tech support, we sought the tirne-saving luxuries of high-speed Internet access that wouldn't interfere with the older telephone technology. For four days the magic worked: instant access to infinite worlds. Then, nothing. Distressed and disappointed, but not ready to give up on Progress, we eagerly await the technicians who will yet bring some form of broadband to our neighborhood.

As I thought about communication 's dual pleasures, sending messages out and getting others in return, I thought about the Pioneer 10 space probe, launched in 1972 with its famous plaque outlining human forms, and the twin 1977 Voyager spacecraft, still carrying Earth's message on their gold-plated disks beyond the solar system. [See page 10 for news of Pioneer 10.] How much faster would our hearts pump should someone answer, even if undecipherably? Would we feel fear or eagerness? Both? Imagine the turmoil receiving one small message would generate. Likewise, only the most unimaginative could not have hoped for some glimmer of success from the short-lived U. S. Search for ExtraTerrestrial Intelligence program (SETI) inaugurated Columbus Day, 1992, having been renamed the High Resolution Microwave Survey to help avoid the "giggle factor" among assorted skeptics. We can recall, also, the quite serious, even desperate, efforts a century ago by noted scientists and others to use ilien-new radio technologies to contact the dead. There may be no communication desire stronger than that to receive a message from a loved one eternally removed from us.

Finally, searching on a whim for websites about groups and histories of citizen band radio (CB), hoping to find some sidebar story to complement this issue 's article on French CB, I carne across a curious confluence. A site that carne up featured not only CB stories and information about old devices, but links to stories about CB use in a particular magazine. When I went to that magazine's web site, what to my wondering eyes should appear but a journal on extraterrestrial contacts. Of course-messages from unknown sources in the night, I should have thought of it.

Ifs not that ilie medium is the message, in any simple sense. But, without a medium, there is no message, or even ~ of a message. As the red ochre stones have done and we hope the Voyager spacecraft will do, the very fact of a medium's presence tells its finders that a message could exist. That was part of SETrs lure as a communication technology–are there messages out there that we cannot receive? Listening, watching, waiting. All part of the humanity of communicating, especially on a dark road with only a CB for company.

Pamela W Laird

Dishing It Up: Really Big Antennas

Uplink-Downlink

The Dish (2000) introduced the moviegoers to the hidden world of spacecraft tracking, albeit at the Parkes telescope in the middle of Nowhere, Australia. Many other movies have incorporated dish antennas into their story lines, the most memorable to most is Carl Sagan's *Contact* (1997). Despite the accurate (photographic) portrayal of what the antennas look like, they tell us nothing about their history—and that's what Mercurians' inquiring minds want to know!

The Deep Space Network (DSN) is the National Aeronautics & Space Administration's (NASA) global system of spacecraft-tracking antennas. Created in 1958, the DSN grew up with NASA and the planetary missions managed by the Jet Propulsion Laboratory (JPL). The original DSN dishes were located in a desolate locale, a part of the Mojave Desert in southern California known as Goldstone, near (to stretch the meaning of "near") the town of Barstow. Additional DSN dishes are located in Spain and Australia.

NASA has just published the first history of the DSN, *Uplink-Downlink:A History of the Deep Space Network, 1957-1997* (Washington, D.C.: NASA SP-2001-4227, 2002). Its author, Douglas J. Mudgway, started working on the DSN at JPL in 1962, while it was still in its technological infancy. Not surprisingly, *Uplink/Downlink* focuses on the advanced technologies that made the DSN work over the past four decades. For example, it shows how DSN managers took advantage of the sweeping rise of digital technology in the 1980s and of specialized timekeeping devices such as atomic clocks and hydrogen masers.

Mudgway also highlights the role of the DSN in making significant scientific discoveries, especially in radio and radar astronomy. Additionally, he puts a human face on the DSN with his discussions of key leaders Eberhardt Rechtin and the late Nicholas Renzetti

The Goldstone Complex

The Goldstone Dry Lake in the Mojave Desert is surrounded by hills which help protect the sensitive receivers from Earth-based radio "noise" that would interfere with weak signals from spacecraft. In 1958, Jet Propulsion Laboratory (JPL) team tested various sites for radio interference before selecting this spot. After less than a year of intense construction work, the site was ready to began operation to follow Pioneer 3 on its trajectory to the Moon. Now the Goldstone Deep Space Communications Complex fills 52 square miles with a whole community built up to operate the giant antennas and to develop prototype equipment to extend communication range and increase data transmission rates. Rather poetically, NASA named each of the antenna units for its first space mission or activity. Pioneer(DSS-11) was the original but was deactivated in 1981. The others are Echo (DSS-12), Mars (DSS-14), Uranus (DSS-15), Apollo (DSS-16), and Venus (DSS-13).

Long Ago and Far Away

"Pioneer 10 Lives!" exaults the headline of a 2 March 2002 news update on the NASA website <http://solarsystern.nasa.gov/whatsnew/pr/020302A.html>. Larry Lasher. Pioneer Project Manager, reports enthusiastically that an uplink transmission from Goldstone, California, succeeded in reaching the famous 1972 spacecraft during its 30-year launch anniversary.

The signal went up from the Deep Space Network (DSN) 70 meter antenna DSS-14 (see below). The returning signal came in to DSN antenna DSS-63 in Madrid, Spain, 22 hours later. To the gratification of many, including those who worked on Pioneer 10 originally, this successful communication circuit indicates that the "spacecraft is still healthy" and is still generating power. Its thermometers reported [illegible] at the scales' lowest ends—"extremely cold." Remarkably, Pioneer 10 executed two commands and returned new data from the one scientific instrument still working, the Geiger Tube Telescope.

NASA built this huge dish antenna, Mars (DSS-14), in 1966 at 64 meters, then upgraded it to 70 meters in 1988 in preparation for Voyager 2's 1989 visit to Neptune. Part of the Deep Space Network, its service has included tracking long-distance spacecraft. In early March 2002, it sent signals to Pioneer 10 (see above). The antenna also services radio and radar astronomy projects. Its narrow receiving beamwidth allows pointing accuracies of 0.006 degrees. So this is a precision device although the dish and the mounting structure on top of the pedestal weigh nearly 6 million pounds. The tiny dots below the antenna are trucks and cars. See <http://gts.gdscc.nasa.gov/PAGES/BWOOD/BOOKLET.HTM>

Journal Announcements

Exploratù>ns ill Media Ecology, the journal of the Media Ecology Association, is dedicated to extending our understanding of media and media environments. *EME* publishes articles, essays, research reports, reviews, and probes. In addition to the study of media as they are traditionally understood, media ecology is concerned with the examination of communication, language, symbolic form and signification, technology and technique, information, systems, and both humanly modified and natural environments.

EME welcomes diverse theoretical and methodological approaches to the study of media environments. Manuscripts will be subject to blind review. To submit manuscripts, contact either of the coeditors, Judith Yaross Lee, School of Interpersonal Communication, Lasher Hall, Ohio University, Athens, OH 45701 <leej@ohio.edU>, or Lance Strate, Department of Communication and Media Studies, Fordham University, Bronx, NY 10458 <Strate@Fordbarn.edu>.

For submissions focusing on teaching strategies and resources, contact Teaching and Education Editor, Sal Fallica, Department of Culture and Communication, New York Unviersity, 239 Greene St., Suite 735, New York, NY 10003 <sjfl@is4.nyu.edU>. Potential reviewers should contact *EME* Review Editor Thom Gencarelli, Department of Broadcasting, Montclair State University, Upper Montclair, NJ 07043 <gencarelli@mail.montclair.edU>.

Individual subscriptions and more information are available with membership in the Media Ecology Association. <www.media-ecology.org>

The *Journal of Radio Studies (JRS)* seeks manuscripts & book or video reviews for its Summer 2002 issue by May 1, 2002. Studies may focus on any contemporary or historical area of radio including: rhetorical studies, propaganda, personalities, drama/popular culture, radio in national development, alternative/minorityradio, internet radio, talk radio, management, ethical/legal issues, advertising, cultural history of radio, political use of radio, and international studies.

JRS encourages interdisciplinary inquiries. The call for papers can be found at -cwww.beaweb.org».

Contact: Frank Chorba, *Journal of Radio Studies* Editor, Mass Media Program, Washburn University, Topeka, KS 66621; 785-231-1010 x1805; <zzchor@washburn.edu>

A new interdisciplinary journal *Visual Communication* will define "visual" to include still and moving images, graphic design and typography, fashion, the built and landscaped environment, the role of the visual in relation to language, music, sound and action. It will critically investigate how the social world is constructed, represented, and contested in visual discourse; examine the use of the visual in a range of sociological, anthropological, historical, and scientific research areas; explore the structures and histories of the languages and technologies of visual communication, and their relation to those of other modes of communication; describe and contextualize (socially, culturally and historically) the use of these visual languages and technologies.

Visual Communication issues will include academic papers, visual essays, reviews covering books, magazines, films, CD-ROMs, websites, exhibitions and artifacts. For more information see <www.sagepub.co.uk/journals/Details/j0359.htm.1>.

Contact Debbie Cock, Journals Marketing Manager, SAGE Publications, 6 Bonhill Street, London EC2A 4PU; Tel: +44 (0) 20 7374 0645, x2212; Fax: +44 (0) 20 7374 8741; <debbie.cock@sagepub.co. uk».

Communications Under the Seas

The Dibner Institute in Cambridge, Massachusetts, will feature an exciting conference on "Communications Under the Seas: A Twice-Rejuvenated 19th-Century Technology and its Social Implications." Bernard Finn (Smithsonian Institution) and Daqing Yang (George Washington University) have organized this event, scheduled for 19-20 April 2002. The description reads:

In the closing decade of the twentieth century we were presented with a world-wide communications system of breathtaking speed and capacity. Economically it was spawned by society's voracious appetite for information, especially as generated by computers and fed over the Internet. Technologically it was made possible by low-loss optical fibers, an indication of the increasing importance of science in an industry that for its first century paid little attention to research.

The implications of this for society are difficult to predict. Will it bring greater stability to economic markets, or make them more erratic? Will it encourage the expression of multiple voices, or the dominance of a few? Will its net effect be to serve the cause of peace, or of strife? And will the conflict between wired and wireless be settled-at least for the twenty-first century-e-in favor of the wires, or will the ether (presumably with the assistance of satellites) mount an effective response?

If we cannot foresee how these issues will be played out in the decades ahead, we can at least examine how they have been dealt with in the century and a half behind. Technologically the dominant factors have been speed and bandwidth, in either broadcast or point-to-point format. Socially the major issues can be lumped under questions of access and control.

It is the purpose of this conference to examine the history of international communications, with special emphasis on underseas cables, in order to understand in better fashion the ways that these issues have been dealt with in society. We will not be able to provide solutions for the future, but we should be able to give evidence of the complexities that are bound to surround them.

The conference's program is available at: <http://dibins t. ruit. edu/ DIBNER/Worksho ps/S pri ng/ Spring2002Program.htm>

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