Dial Log

Director's Report
By Jody Georgeson

It occurs to me that we have a lot to be grateful for in this new year. The things that assure the future of our organization are like a three-legged stool.

The first leg consists of our many members and supporters. You all have made it possible for us to remain in the business of preserving the telephone industry's history. A special thank you goes to the **Qwest Foundation**, which has renewed its commitment by awarding us a grant of $50,000. Qwest also very generously continues to give us space and utilities in three of their buildings-- something we could never afford to pay for outright.

Just as important is our dedicated group of volunteers, who perform the down-and-dirty, day-to-day work around here. Herb's article on page 2 illustrates some of the many activities they participate in.

The third leg of our support is our Board of Directors. Some of them were instrumental in forming this organization, while some have joined us more recently.

All share a dedication to the collection and preservation of our collective history, and volunteer their time to oversee our efforts. A list of current Directors is on page 2.

I'd like to direct your attention to a couple of other articles in this issue. We have two new book announcements: one is the second edition of *Old-Time Telephones! Design, History, and Restoration* by THG member **Ralph O. Meyer**; the other is *Pull: Networking and Success since Benjamin Franklin* by THG Director **Pamela Walker Laird.**

Check out the opinion article by **Louis Galambos**, a professor at Johns Hopkins and the John W. Kluge Center of the Library of Congress. His piece explores some of the reasons that the history of business is important to the continued success of our country.

We also have the latest installment about the Museum of Communications, by **Don Ostrand** (page 4), and various other articles designed to enlighten and entertain you.

I hope you enjoy reading this issue as much as I've enjoyed putting it together!

A Snap Shot of THG
By Herb Hackenburg

Thinking that the THG membership would find it interesting to know more about what we do at the Denver archives, I've decided to provide you with a "snap shot" of the activities going on around here on an average Wednesday (our main volunteer day).

As usual the first volunteer to walk into the door is our newest, **George Howard**. George has a large box of doughnuts. Many of our members know George since was a significant collector of antique telephones and is a telephone historian. A few years ago George sold

most of his phone collection and began to collect Caterpillar tractors--real tractors, not models. After he retired as a New York State judge, George moved to Denver and became a THG volunteer. Today he continues to index books from Alexander Graham Bell's library. Those who know George know the indexing will be complete and very thorough. Today he reached his 6,000[th] entry and he's only part way through the fourth volume.

Most of these are bound volumes of periodicals published in England in the mid-1870s and concern the "new" telegraph, telephone and electronic industries. George said he's found the articles to be, "absolutely fascinating." He went on to point out that these volumes are, "a plethora of original source material that's been long lost to those in today's world. With their detailed material about the telegraph industry, it's easy to see the genesis of many of the original practices in telephony." Wait till he finds some of Bell's marginal notes.

U S West retiree **Jerry Wild** walks in. As usual, he has a cheerful "hello" for everyone and waits for **Jody Georgeson** (THG archivist/executive director/entire paid staff) to tell him what machine needs fixing this time. Jerry can fix about anything. Today it's our main computer, which, oddly enough, is called "Jerry." Last week he fixed our Xerox machine, the week before that it was our portable

display of working step switches (given to THG by the Telephone Pioneers in Cedar Rapids, Iowa), which was a big hit at the Qwest exhibit at the 100th edition of Denver's Annual National Western Stock Show and Rodeo.
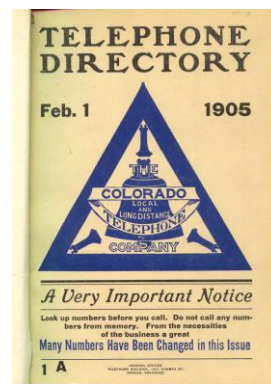
Betty Vigil, a U S WEST retiree, spent most of the morning with another U S West retiree **Bruce Amsbury,** preparing the 2005 telephone directories to be shipped to a local bookbinding company so they can be shelved with the rest of our directory collection. New 2006 books arrive from Dex nearly every day, and on Wednesdays Betty enters them in the THG database. When Betty isn't processing directories, she is placing rare historic telephone company stock certificates on E-Bay. Don't be alarmed--these certificates are extras.

Dale Norblom, a U S WEST retiree, sometimes helps Betty as she jumps through all the hoops to get something on E-Bay. It's a rare Wednesday that Dale is not volunteering at THG. Dale is our main researcher in finding requested listings in our directory collection. We receive requests from all over the nation to find listings in our old directories, which we do for a fee. Dale also has processed a significant part of our collection of historical documents.

Ken Pratt, a Mountain Bell retiree, our oldest volunteer who has served THG

nearly as long as I have, has processed the majority of our main collection.

Ken began in the days when we really didn't know what we were doing. Jody has worked hard at "profess-sionalizing" the THG archive. After retiring from U S WEST, Jody went back to college and earned her Master's degree in Library Science from the University of Denver, with a concentration in archives management. With much patience, Jody has almost shaped up the volunteer aspect of THG to "professional archives standards." Along this line, Ken is redoing his previous work to meet those standards (e.g., removing staples, straight pins, Scotch tape, old file folders, rubber bands, dead bugs, etc.)

Ron Swanson, an AT&T retiree**,** is going through the THG photograph collection, pulling assorted pictures of open wire construction for someone who is writing a book about said subject. With pictures to which we own the copyrights, we provide prints and authorize limited specific use for a fee. Ron has also helped Jerry Wild with the step switches and has inventoried a couple of large collections.
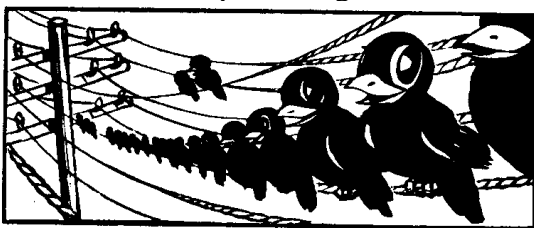
Curt Furness is a retired school administrator and noted antique telephone collector. At THG, Curt is our photo archivist. He has become adept at "reading" old photographs (e.g., looking at the license plate on a truck to find out what year the photo was taken.) Curt also helps us put our stock certificates on E-Bay; traveled to Illinois to pick up a large collection of antique telephones donated to THG by a collector; and helped THG do an oral history of his in-laws who

happen to own the Rye Telephone Company (one of the most modern independent phone companies in the nation.).

In our next issue, we'll introduce you to: ***Mary Riffle, Roy Lynn, Milo Masura, Norman Birt, Beth Trudgeon, Merlin Creason and me, Herb Hackenburg****.*

MUSEUM OF COMMUNICATIONS
Part of the TELECOMMUNICATIONS HISTORY GROUP, INC.

#1 XBAR STORY
by Don Ostrand

In the City of Seattle, conversion to dial service employed either "Panel" or #1 XBAR switches. Eight major wire centers were #1 XBAR offices. That fact made it important to preserve the technology in the museum project.

Development of #1 XBAR was state-of-the-art in the 1930s and was designed for high call volume areas. That filled the bill for metropolitan Seattle's projected needs. As Pacific Telephone and Telegraph scheduled upgrading Seattle's telephone service from operator handled service to dial service, #1 XBAR was selected when it became available. #1 XBAR joined the earlier installations of panel equipment to provide citywide dial service. (It should be noted that after the initial installations, most future growth of switching units employed the newer #5 XBAR equipment.)

At the time the museum was first planned, the objective was to preserve, in working order, equipment used in building the telephone network in the Pacific Northwest. Surely the #1 XBAR

had its place in that development. As our fortune would be, two wire centers were undergoing technology upgrading just as our search for equipment was underway. The Lakeview and Parkway wire centers were our source for equipment.

Our volunteer crew was given the opportunity to visit both Lakeview and Parkway and select as many individual equipment bays as possible to make a complete, operable switching unit for the museum display. Timeliness of availability was key in the selection of each individual bay, so we have bays from both loca-tions.

We were fortunate to have had very talented volunteers; some had retired from Western Electric Installation and some had retired from PNB Central Office Mainten-ance forces. All had years of experience in #1 XBAR.

The # 1 XBAR office is comprised of two sets of components. Originating calls and terminating calls use unique sets of equipment, with the subscribers' appearances being used in common.

The subscribers' appearances are on the line-link frame's primary switches. The term "line-link" is derived from the functional use of the frame. All subscribers' lines appear on a line-link frame primary switch and the linkage or "links" to the telephone network appear on the secondary switches. The secondary switches are divided into two groups of 10 vertical units each--10 for originating calls and 10 for terminating calls.

An originating call starts with the subscriber lifting the handset from the telephone set. That sends a signal to the CO equipment that someone is placing a call. The CO equipment searches for that subscriber and connects it to an idle "district junctor" which provides a path to an idle subscriber sender. The subscriber sender records the information received from the calling subscriber's dial or touch pad. Information recorded by the subscriber sender is passed along to the originating marker where it is used to route the call and establishing the talk path or connection within the office.

Terminating calls arrive via an incoming trunk. The call setup information pas-sed from the originating office must be recorded to allow routing of the call to the terminating sub-scriber. To facil-itate this, the incoming trunk has two appearances: one on the primary switch of the terminating sender-link frame; and one on the primary switch of the incoming-link frame. When the incoming trunk is seized the sender-link controller selects an idle terminating sender, which gives the go-ahead for the originating office to transmit the called number information.

The incoming trunk is connected to called number subscriber's line and the terminating sender is released for use on another call. Having received that information, the terminating sender passes the information to the terminating marker. The marker calls in the number group connector to determine where the

called number resides on the line-link frame. The incoming trunk is connected to called number subscriber's line and the terminating sender is released for use on another call. It also signals the incoming trunk, the incoming link frame and the line-link frame to complete the linkage to connect the trunk to the subscriber's line.

One lineup of equipment bays allow for the routine maintenance of the switching unit. The TST (terminating sender test) bay is for routine testing of the terminating senders. The terminating sender receives the call setup information from the distant office. One terminating sender malfunctioning can create difficulties in completing calls. By routinely testing the functionality of the terminating senders, troubles of this type can be minimized. The TTI and OTI are the trouble indicating panels for terminating and originating calls.

The various components have built-in timing circuits, and when the call setup time exceeds the timing interval, the trouble indicator is called in. The lamp panels light up to indicate a failing call. The technician records the lamp indications on the large trouble log. As failures are recorded, a pattern begins to develop. When a pattern has developed the technician can take action to isolate the failing component and remove it from use. Trouble indicator panels are labor intensive and require constant surveillance.

Talk circuits (or "trunks") to distant offices become the telephone network and allow the wide range of telephone service we all enjoy. One circuit or trunk that doesn't operate properly can impact the callers' ability to complete their calls. The OGTT (outgoing trunk test) bay allows the maintenance testing and repair of trunks. When it is determined that a trunk fails to meet routine testing requirements, a "make-busy" plug on the OGT jack bay will remove it from service.

As with the terminating senders, a malfunctioning subscriber sender can adversely impact calls. The next two bays, the SMB (sender make busy) and the OST (originating sender test) bays are employed in maintaining the outgoing equipment.

The DJT (district junctor test) bay routinely tests the linkage within the switching unit. Junctors are the paths between the various components that become your talk path.

There is a strong possibility that the museum has the last working #1 XBAR switching unit in existence. The #1 XBAR equipment served very well but didn't have today's features. Without call forwarding, call waiting, number portability and the like, #1 XBAR became obsolete and was replaced with ESS (electronic switching system).

When Uncle Joe Cannon, Republican Speaker of the U.S. House of Representatives (1903–1911), heard that Theodore N. Vail had resigned as General Superintendent of Railway Mail Service, he exclaimed, "What for?"

"Why, he is going into that thing invented by Bell, the telephone that talks over a wire," he was told.

"Well," said Cannon, "that is too bad. I always liked Vail. Hubbard [Bell's father-in-law and partner] tried to sell me some of that stock. I am sorry he got hold of a nice fellow like Vail."

Telegraphers' Paralysis

This article first appeared in The Telegraphic Journal, April 15, 1878, and was brought to our attention by volunteer George Howard, who is indexing our collection of materials from Alexander Graham Bell's library.

This peculiar nervous affection is causing some alarm at present amongst [*telegraph*] operators in America, where it appears to be unusually prevalent. It is a numbness and paralysis which affects the thumb, hand, wrist and even forearm of the operator's right or keying hand, and positive pain is felt in attempting to handle the key when afflicted by it. It is unquestionably due to overstraining of the nerves and muscles in the rapid, minute, and monotonous motions of signaling; and is generally cured by rest. Its greater frequency in America than in Europe seems to be due to the "space" letters of their alphabet, and perhaps to the longer hours that American operators remain on duty. It appears to us that the happy mixture of dots and dashes, long and short signals in the Morse code, as it is used in England and the Continent, is calculated to prevent paralysis, for every dash is a brief rest to the hand.

The matter has become so serious in America that there is talk of introducing a new code to replace the Morse as there

practiced. It would certainly be a safeguard against paralysis if every operator would learn to signal, at least moderately fast, with his left hand as well as his right. He could then occasionally rest the right, and perhaps more expert hand, thus giving it time to recover its full vigour before any over-stressing had taken place. This disease in question excited some discussion in England several years ago, but it appears to have died our of late, since we now hear nothing of it.

We should be glad to receive any information on the subject from English clerks, or others, who have it to give, for it may prove useful to American telegraphers. Have the Post Office hours of duty anything to do with its apparent disappearance from among us?

The term "Carpal tunnel syndrome" was first used in the 1930's to describe a condition that had first been described by Sir James Paget in 1863. Today the carpal tunnel syndrome is more frequently recognized and appropriately treated.

Telephone Dreams

According to Dream Moods™ (http://www.dreammoods.com/)**,** to see or hear a telephone in your dream signifies a message from your unconscious or some sort of telepathic communication. You may be forced to confront issues that you have tried to avoid.

To dream that you do not want to answer the ringing telephone indicates lack of communication. There is a situation or relationship that you are tying to keep at a distance. To dream that you have trouble hearing over the telephone signifies that you are the center of some malicious gossip.

Books
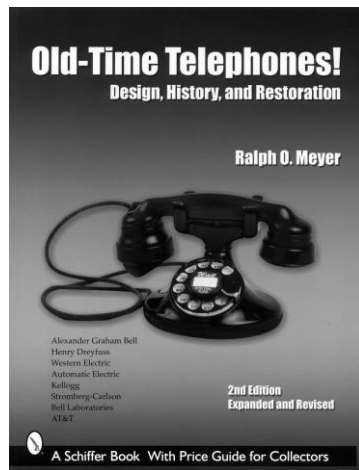
***Old-Time Telephones! Design, history and Restoration* (2nd edition)**
By Ralph O. Meyer
Schiffer Publishing, 264 pp., $29.95

This expanded and revised edition by THG member Ralph Meyer is not just another modern book about telephones. According to Ralph, it is the only comprehensive history of the development of the telephone during the Bell years, with the technical information intact. It has been formally endorsed by both ATCA and TCI, and contains a forward by the curator of Bell artifacts at the Smithsonian Institution.

More about the book, and the features that are new to this edition, can be seen at www.oldtimetelephones.com.

Old-Time Telephones! is available from Amazon (www.amazon.com), Phoneco Inc. (608-582-4124), local bookstores and from the publisher (www.schifferbooks.com).
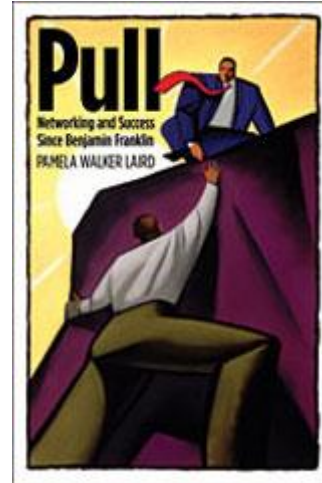
PULL Networking and Success since Benjamin Franklin
by Pamela Walker Laird
Harvard University Press; 439pp; $29.95

Pamela Walker Laird, a historian at the University of Colorado at Denver (and THG Director) writes about the importance of social capital or "pull" in determining the success of individuals throughout America's history. She explains how the concepts of mentors, networking and role models that were developed in the late 20th century allowed historians to view successful people--such as Benjamin Franklin, Andrew Carnegie, and Bill Gates--in a new light. By doing so, she explodes the myth of the "self-made man".

According to Dr. Laird (in an email interview with David Teten, at www.thevirtualhandshake.com/blog/),
"The reason that social capital is necessary is that business is inherently, profoundly, a social process. It requires interactions, whether those be competitive or cooperative. Therefore, being a self-made success is impossible. That doesn't mean that ambitious people can't grow their social capital. It means that they must maximize the productive ways in which they interact with others who can assist them."

The Business of History
By Louis P. Galambos

The following is excerpted from an article published on the Opinion page of The Wall Street Journal, on Tuesday, March 7, 2006, and is used with their permission and that of the author.

What did you learn about business in the history course you took in your college or university? Not much, I suspect. Not if you're thinking about the kind of business you do every day, the company you work for, and the people with whom you work. You may have learned a bit about the Robber Barons of the late 19th century. Or the antitrust cases of the 20th century, the business frauds uncovered by the Great Depression of the 1930s, or, if you were really lucky, the insider trading of the 1980s.

What you wouldn't have learned is how the U.S. became the world's leading industrial power in the late 19th century, and why the nation has been able, through the following decades, to keep its position as the world's most successful economy. Ever! Through scandals, depressions, wars and great waves of international competition --through the first, second and third industrial revolutions-- the American business system has remained flexible, efficient and, above all, innovative.

*   *   *

That story--one that weaves together bankruptcies, frauds, booms and busts with stunning breakthroughs and ultimate success--should have a central role in American history, and that's the challenge that makes it exciting to write the history of American business. That's what I decided almost 50 years ago. I'm still excited about it today.

It's not always an easy field for serious scholarship. You can't just truck off to the National Archives or the Library of Congress and find the documents you need to write a reliable account of business strategies, structures, decisions and operations, or their impact on the American or the world economy. The National Archives and the Library of Congress have wonderful resources. But very often the business historian needs to work with a company or an individual executive to get access to essential records and opportunities for interviews.

When you do move inside business, you can get tangled in some very sticky problems. You may run into a vice president who is convinced that business is all about the present and the future, not the past. The skeptical VP will probably roll out an appropriate cliché--perhaps quoting Henry Ford, "History is bunk." Or, the skeptic may tell you that "Hindsight is 20-20," an empty idea that ignores the simple fact that all evaluations of performance, whether of a CEO or a foreman on the shop floor, are based on past performance. That is, on the history of the individual and the organization. If Henry Ford had really thought about the history of his organization and similar businesses, he might have avoided pushing his great enterprise to the edge of bankruptcy in the late 1920s. He could have learned a great deal about the Ford Motor Company's distinctive culture and strategy from its history, and maybe even understood why General Motors was driving Ford to the wall. Much later, Henry Ford II learned those lessons and pulled the company off the path to failure. . . . .

The Institute [*for Applied Economics and the Study of Business Enterprise*] explores the unending American effort to

balance the need for innovation and efficiency with the powerful desire of all societies for equity and economic security. The best sign that our political economy has done a good job of achieving this balance is that very few of us are completely happy with the outcome. Democratic capitalism works because it generates compromises and facilitates change.

How much change? Well 50 years ago, the world was swinging sharply toward state-owned enterprise and centrally controlled economies. President Eisenhower was worried that the U.S. might soon have no trading partners, no allies dedicated to democracy or capitalism. Today, the world has swung just as decisively toward democracy and the sort of market-oriented enterprises that are the big muscles in all of the developed economies, including the U.S. The performance of business--from giant multinational corporations to tiny start-ups--has had a great deal to do with that transformation and business historians have, I'm convinced, helped us to understand that essential aspect of our history. I'm pleased by what we have learned about business. I'm looking forward to what the next generation of business historians will tell us about the new global economy of the information age.

Mr. Galambos, a professor at Johns Hopkins and the Maguire Professor at the John W. Kluge Center for the Library of Congrss, is the author, with Ray Vagelos, of "Medicine, Science, and Merck" (Cambridge, 2004)

Telephone History

Alexander Graham Bell was granted a patent on his telephone 130 years ago, on March 7, 1876 What a lot has happened since then!

100 Years Ago - 1906
- Bell System engineers introduced a sender, a new development for machine switching. This led directly to the development of the panel switching system.
- The New York telephone directory included for the first time a paragraph referring to Information Services.
- Local calls from a public telephone in cost five cents.

75 Years Ago - 1931
- The Oceangate, NJ transmitting station opened for ship-to-shore telephone service.
- AT&T inauguratied its teletypewriter exchange service, TWX.

50 Years Ago - 1956
- Overseas telephone service was extended to Kuwait, Saudi Arabia and Jordan.
- Bell Labs announced a new type of transistor to replace the vacuum tube .
- The nation's telephones passed the 59 million mark.
- The first of a series of one-hour color television science programs produced by the Bell System on, *Our Mr. Sun,* appeared on CBS.
- The 1956 Nobel Prize in physics was awarded to the inventors of the transistor: Dr. William Shockley, Dr. John Bardeen, and Dr. Walter H. Brattain of Bell Labs.

10

Telecommunications History Group
P.O. Box 8719
Denver, CO 80201-8719

SAVE AMERICA'S TREASURES
OFFICIAL PROJECT

2000