

IASPEI Archive Committee Meeting -- July 4, 2003

Sapporo, Japan

The meeting was chaired by Willy Lee, who asked that the different national representatives speak about the archive situation in their country. After a brief introduction by Willie Lee, Jim Dewey (one handout) summarized the SSA AD HOC archiving committee purpose. This committee will work to foster communications regarding archiving of seismic data (seismograms), station bulletins, intensity surveys, etc. The committee has international representation and will work on an international level according to interest. SSA is working to advocate data archiving, not to archive any data itself.

Joseph Batllo (two handouts) spoke for Spain and also for the ESC WG on the History and Data of Instrumental Seismology. In Spain there are many seismogram collections and station bulletins, but there is no system for regulating access to these materials. Some data were digitized in 1985 but the quality of these is not good. Finding old bulletins can be difficult. A Bosch-Omori instrument has been reconstructed; it is the only working one in Europe. In addition to seismograms and bulletins, other sorts of data have been archived, notably macroseismic survey data for Catalonia since 1913. Batllo distributed two sheets summarizing work in Spain to archive and make data available and ESC WG objectives.

Yun-Tai Chen (no handouts) spoke for China. Before late 1970's, the Institute of Geophysics, Chinese Academy of Science preserved seismological materials. Presently, these data are preserved at the Institute of Geophysics, China Seismological Bureau (IGSSB) in Beijing. Seismograms are preserved in their archives. They have seismograms from 12 Kirnos instruments before 1970's. Presently, they have 47 digital seismograph stations (China National Digital Seismic Network) and also data from other local seismic networks. The CNDSDN data are archived in IGCSB and the local seismic network data are in local data centers. The government allows only data from 24 stations to be released. Those data are well archived. Chinese scientists are working for release of the rest of the data. All earthquake bulletins are already published and archived in IGCSB or local seismic data centers of provincial seismological bureaus. The oldest geomagnetism material goes back to the late 19th century, seismological data from the early 20th century.

Keyi Doi (no handouts), speaking for Japan, reported that seismograms of stations maintained by ERI before the 1980s have been microfilmed, and digital archiving of more recent waveform data is under way. The ERI digital archive has CD ROMs for every event since 1980. Since 1990 they have cartridge tapes of continuous data. Since 1997 they have operated a satellite link of data from all universities in Japan (500-600 stations). All of these data are recorded on tape. Before 1927 they have University of Tokyo data on 35 mm film.

Nobuo Hamada (see handout) then spoke, saying that early phase data (since 1923) has been distributed on CDROM. He reported that the big problem was not enough space to archive all seismograms; they are stored at individual stations. The microfilms are not easily scanned and are not of sufficient resolution for many purposes. Data from before 1923 are difficult to find and access. Many pre-1923 records were lost in the Kanto earthquake.

Roger Musson (no handout), speaking for the UK, reported that all existing collections of seismograms are now centralized in the archives of the BGS and that a purpose-built archive is about to be constructed to preserve all historical geoscience data in the UK. Formerly, the old data were stored locally and sometimes lost. Since the 1980s, all historical seismograms and archival material are stored at one place (BGS, Edinburgh). Musson warned that original records must be preserved, but there are three problems: 1) they must be stored in good archival conditions; 2) they must have someone to look after the records; 3) the records must be accessible. The new archival building that the BGS has permission to build will archive all historical geology and geophysics data and papers in the BGS collection.

Johannes Schweitzer (no handout) spoke for Germany and Norway. In Germany, there are problems preserving data in Karlsruhe; they managed to preserve their data at another institute. Germany now has an overview of seismic stations before 1921 and bulletin material since then. Willie Lee has scanned much of this material. Schweitzer has a web page at NORSAR on this material. He encouraged that material be scanned and distributed (and not just kept at one place). Some material only exists because it was distributed. One problem is that old digital data on tapes are not readable today. Someone must find ways to reformat and transfer these old data to new media. For example, much LASA data has been discarded.

Bob Engdahl (no report) talked about scanning and OCR old ISS bulletins and BCIS bulletins. He also obtained a tape from the ISC where punch card data were put on tape. They processed and sorted the data and relocated earthquakes from 1918 to 1942 (Engdahl & Boyd). 1953-1960 ISS data have been scanned and processed. All these data have been put in 1996 ISC format. They have a database of all station information since 1914, with their proper co-ordinates. Willie Lee has scanned old station data and put it on a CD.

The meeting was then opened for discussion. Willy Lee described the work he had been doing in scanning historical seismological material.

Willy Lee suggested that a DIY approach to scanning should be adopted. It should be a requirement that scanned data accompany published papers as a backup, preferably with ISC as the logical place for a depository. ISC would then duplicate CDs or DVDs on demand and be responsible for migrating data on to successive digital formats.

This sparked a vigorous discussion on the practicalities of such a scheme. Ray Willeman said that ISC was accepting data on early earthquakes for integration into a comprehensive ISC database, and that ISC can also handle metadata. The ISC preserves all files in original format on a hard disk. They also have links on their web site to data elsewhere. Non-bulletin data are regarded as “metadata” and can be included in the database. All unassociated data are available on request by station. Linking to background data is helpful for research, but handling very large volumes of data for every study would be onerous for the ISC. Willeman also stated that the ISC cannot handle a waveform data archive.

Bob Engdahl was unsure what role IASPEI should play but suggested that there should be an IASPEI WG on archives, which would have a more international outlook than the SSA Committee. (Note: this was subsequently adopted by the Commission on Seismological Observation and Interpretation). Willie Lee urged IASPEI to synchronize with SSA archiving committee. John Ebel said that SSA and IASPEI should only have the role of advocates of archiving solutions. He also noted the electronic supplements of BSSA papers are one way that new data will get archived. Jim Dewey said that the cataloguing of data and disseminating knowledge of what was where is essential. If information on the availability of cataloged data is not known, then it is not usable. Josep Batllo noted that the same concerns were felt by the ESC WG on History and Data of Instrumental Seismology. Digital waveform data can be archived by IRIS or other centers with similar objectives. The ESC (European Seismological Commission) is also looking into archiving data.

There followed a discussion of problems with proposals for archiving data. The largest earthquakes are the most important for archived data, and we must preserve those data. What committee should do this, and how? Willie Lee argued that if ISC charged a fee for data, there could be enough funding to make his proposal operational.

At this point time was called and the meeting was discontinued.

Archiving Meeting -- July 4, 2003

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Jim Dewey -- USA

SEISMOLOGICAL SOCIETY OF AMERICA *AD HOC* COMMITTEE ON DIGITAL ARCHIVING OF HISTORICAL SEISMOLOGICAL DATA

Overview

The Committee was established at the 2002 Board of Directors Meeting of the SSA, to address the need to preserve for future researchers such fragile seismological data as analog seismograms and station seismological bulletins . The specific charge of the Committee was to investigate how the SSA might aid the digital archiving of legacy seismological data. In view of the current fiscal impossibility of digitally archiving all important legacy data, the Committee has also considered how to encourage maintenance of legacy data sets in their original format.

The projected SSA role in the archiving of legacy data is primarily to foster the development of such archiving. With the possible exception of archiving data associated with its own publications, the SSA would not be the archiving agent.

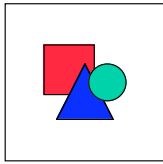
SSA-specific strategies suggested to encourage the effective archiving of legacy seismological data.

- Establish an SSA-sponsored web-site devoted to legacy data. Such a web-site might include: links to legacy data sites world-wide; a “legacy-data rescue” exchange in which institutions could publicize the availability of legacy data that could be adopted by others; a forum for evaluating techniques of archiving data.
- Have a periodic “Archival Seismologist” column in the SRL, analogous to the “Electronic Seismologist,” to publicize legacy data issues
- Have a publication policy for SSA journals to encourage authors who have digitized legacy data to specify where the data can be retrieved electronically
- Modify the existing SSA digital-supplement web-site to encourage its use as a repository for digitized legacy data that are associated with articles in SSA journals.
- Maintain an on-line archive of scanned early numbers of the BSSA
- Develop guidelines and recommendations for the SSA to be a “watchdog” against threats to important legacy data and to represent the seismological community in advocating on behalf of critical endangered legacy data-sets.

Goals for upcoming year

- Organize an “electronic community” of seismologists interested in preserving legacy data
- Develop guidelines for SSA advocacy role.
- With IRIS DMC, determine the conditions that scanned seismographic data would have to satisfy in order to be archived at the IRIS DMC.

Josep Battlo -- Spain



European Seismological Commission¹ Working Group History of Seismometry (HoS)

In April 1991 the European Seismological Commission (ESC) set up the new Working Group History of Seismometry (WG HoS). The aim of the WG is to improve the co-operation between seismologists and historians of science and scientific instruments in the retrieval, study and evaluation of the historical heritage of scientific observation of earthquakes in Europe.

The project was based in Europe but contributions, suggestions and future developments can involve the whole seismological community.

Starting from the experience of the TROMOS project, in 1992 the WG HoS started a census of the historical centres (private and public) of the material preserved in existing centres and of historical seismic instruments.

250 questionnaires have been sent to seismologists and historians of science and scientific instruments; 60 of them answered (about 25%) 30 with useful information: from Portugal to Siberia, from Ethiopia to Sweden (Tables 1 and 2). Also seismologists and historians of science from USA, Japan, Canada etc. have shown interest to the activity of the Working Group.

In most cases (80%) in the old observatory or somewhere, something (such as parts of instruments, instruments, papers) still exist. In a few cases instruments are still in operation. In general, historical papers are not in special archives, or well ordered and preserved.

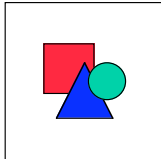
The analysis of the questionnaire outlined the serious threat of loosing a considerable proportion of the historical heritage of European seismology. This could occur mainly where the necessary cultural sensitivity is absent, or in practice where monetary funds, to keep and make available instruments, seismograms and historical documents, are lacking.

Special recommendations, to highlight high risk situations such as deterioration or loss of instruments, seismograms or historical documents, were given in the special session devoted

¹ The ESC is a commission of IASPEI, which is associated to IUGG and its aim is to promote seismological studies and projects in Europe, countries bordering the Mediterranean and immediate neighbours; an area from the Mid-Atlantic Ridge to the Urals and the Arctic Ocean to northern Africa.

to the history of seismology at the 23rd General Assembly of the European Seismological Commission in Prague (Ferrari 1992).

The preliminary impression yielded by the answers to the census carried out until now is of unquestionable usefulness to seismological research, a first important step that also meets the recent ESC recommendations (ESC 1996).



European Seismological Commission
SC-B Data Acquisition, Theory and
Interpretation
WG History and Data of Instrumental
Seismometry

Chairpersons: **Josep Batlló** (Spain), josep.batllo@upc.es
 Graziano Ferrari (Italy), ferrari@sga-storiageo.it

Subtopic : Historical Scientific Seismic Data versus Modern
 Seismology

Chairperson: **Nicola Alessandro Pino** (Italy), pino@ingv.it

From *WG History of Seismometry* to *History and Data of Instrumental*
Seismometry

by

G. Ferrari (former Chairman of the WG History of Seismometry 1992-2002)

In the ten years in which the WG has officially operated the number of communications and the level of participation in our sessions has progressively increased. Born “ad personam”, on the basis of the experience I had developed in Italy with the TROMOS project, the WG has started to lose its anomalous character and has instead taken on an increasingly important scientific, cultural and educational role. These roles may seem to be rather distant from each other, yet in actual fact, taken as a whole, they are reciprocally functional to a complex vision of the seismological problems of all the ages. Knowing the past in order to plan the future is not merely a slogan, but a key for interpreting our daily scientific work. Today, just as a century ago, in spite of the enormous technological strides forward, that are at times even programmable, we can be sure in the knowledge that of the data we are collecting, we are able to use or understand the significance of only a small proportion.

Reconstructing the histories of observatories, biographies and instruments is not useful to us to explain the limits of the scientific paradigms, the technologies or the processing tools, but rather to understand the residual informational potential of the instrumental historical data.

We are faced with an apparent paradox in instrumental seismology: the more the interpretative techniques are honed, the more information is gleaned from the historical

recordings produced in theoretical and technological contexts that are very different from those of today.

To conclude this 'pioneering' phase we can already envision new, important objectives, partly outlined in the topics of the SC-B5:

- the historical heritage of seismology: observatories, instruments (periods of working and characteristics of the instruments, calibration, etc.), seismic bulletins, seismological biographies;
- correspondence in seismology and its scientific relevance;
- methods for elaborating the historical seismograms: from raster images to parameters (scanning resolution, quality, various corrections, etc.);
- the history of the ESC and the other important international seismology associations.

Considering the complexity of goals of the new definition of the working group I proposed (at the Business Meeting of the SC B) to update the name of the WG as:

History and Data of Instrumental Seismology.

Genova, September 4, 2002

Archiving Seismological materials in Spain

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The importance of the proper archive of seismological data and other related materials has been widely recognized long ago in Spain. Nevertheless, actions directed to fulfill these objectives have been scarce, due to the low priority they have in front of other topics. The lack of funding lets, many times, to a voluntarist style of actions, lacking long range goals. Sometimes, lack of understanding of the archival problems let to unfair managing of the documents.

Approximately a half of the materials to be preserved belong to the Instituto Geografico Nacional (IGN), officially responsible for the Spanish seismic network. The other half part belongs to observatories related to different Institutions. On the following paragraphs it is presented an inventory of all actions have been undertaken in Spain.

1. Seismograms.

On 1994-1995, a copy of all seismograms preserved at the TOL, ALM, ALI and EBR seismic stations was done on 35 mm microfilm rolls and it is stored at (IGN) in Madrid. Series of seismograms at the stated observatories are quite complete, and the result is a quite good collection of seismogram microfilms. A standard procedure to demand copies of them has not been developed.

Spain is collaborating with the EUROSEISMOS project and seismograms of the FBR and EBR stations (1200 approx.) included in the list of European earthquakes elaborated for this project are right now in Rome (Italy) for scanning.

1.1 Digitized data.

Up to the present, only a unique project to digitize wave forms on old smoked paper seismograms has been undertaken. Wave forms of regional earthquakes (around 220 events) recorded with several Wiechert instruments operated at TOL were digitized and analyzed. The digitized records are 300-600 seconds in time. The results were published as

Samardjieva, E., Payo, G. and Badal, J. (1997). Catalogue of digital historical seismograms (1912-1962). Instituto Geografico Nacional), Madrid, 62 + 244 pp.

Some other records have been digitized in occasion of special studies for some earthquakes, but there is not a general database to manage the digitized records.

2. Station bulletins.

A national seismological bulletin started in 1924. Prior to this moment, some stations published their own bulletins and continued to do so for a long time. Up to the present moment, it has not been launched any project to preserve them.

Nevertheless, the world compilation of early bulletins by Schweitzer & Lee (2003) contains the early printed Spanish bulletins. Also, under the development of the EUROSEISMOS project, some bulletins of Spanish stations found in Italian libraries are actually under scanning.

None project to digitize the contents of the seismic bulletins has been envisaged.

3. Instrumentation

A “Catalog of old Spanish seismograph” has been produced. It covers the period 1887-1955. It has been intended to be useful for seismology researchers as well as for scholars. It contains detailed descriptions of the technical characteristics of each instrument, images and a complete bibliography. A compressed zip.file of the original pdf file containing the catalog can be freely obtained at the web site:

<http://www.geo.ign.es/servidor/sismo/red/inshis.html>

A presentation of the catalog contents and elaboration process has been published as

Batló, J. and Bormann, P. (2000). A Catalog of Old Spanish Seismographs. *Seismological Research Letters*, vol. 71, 570-582.

A second version of the catalog, with increased number of instruments and observatories, covering the period 1887-1980 is ready. It is expected it will be printed and published, as a book, on year 2004. Also a pdf copy will be put online.

3.1 Preservation

In Spain there are still some old instruments ready for record (Wiechert –horizontal and vertical- at TOL and Mainka and Vicentini at FBR). Some decisions to preserve other old seismographs have been taken. Some instruments belonging to IGN have been concentrated at TOL. The idea to display a collection of geophysical instruments at that place is envisaged.

On year 2001 a project to reconstruct and restore an old Bosch-Omori seismograph was undertaken by IGN. After on year, an operative instrument was presented to the public. To our knowledge, this is the unique Bosch-Omori instrument fully operative preserved-reconstructed in Europe. It is expected to use it in future studies on the behavior of mechanical instruments.

Since 2002, FBR has undertaken the restoration of the early seismographs operated at the station, all of them of Italian origin. Also, some actions to better preserve the station seismograms and documents will be undertaken during the next year.

4. Other documents.

Initiatives to preserve in digital support macroseismic questionnaires, station books, scientific correspondence and other manuscript documents (ex. manuscript manuals for installation and operation of old seismographs) have not been taken; but should be advised for a near future.

Finally, it is word to remember that some really interesting old publications on “observational seismology” are actually hard to find references. Preservation and distribution of these references in electronic format is encouraged.

