Compte-rendu of the WG VI/3
Mariano Cunietti Memorial Meeting in Parma

Mojca Kosmatin Fras, WG VI/3 Co – chairperson

From February 15 to 19, 1999 the WG VI/3 "International Cooperation and Technology Transfer" and the Italian Society of Surveying and Photogrammetry organized a meeting of the working group in Parma, Italy. The one - week meeting was dedicated to memory of Prof. Mariano Cunietti, the Italian acknowledged scientist, in different geo-related disciplines, who died two years ago. His contribution reflected on both Italian national and international level. The meeting took place in the Main Hall of the University of Parma. Parma is a nice city of art and culture and is also known by it's good cuisine.

The meeting was ambitious in program (more than thirty presented papers) and covered different disciplines: digital photogrammetry, architectural surveying, WEB, DBMS and GIS, thematic cartography and remote sensing, metrology and data processing, deformation monitoring, positioning and reference frame, mapping from space and extraterrestrial mapping. A poster session, presenting twelve posters, was organized as well.

The first day began in the afternoon with the opening session, where the academic authorities, Prof.'s C. Scaravelli and C. Monti, presented their welcome addresses, on behalf of the Rectors of the University of Parma and of the TU of Milan respectively. Successively continued with the contributions of the invited speakers, Prof.'s L. Alfano, A. Capello and R. Cassinis who had luck to know Prof. Mariano Cunietti personally and to work with him, recalling their memories of Prof. Cunietti and his work. This session was opened by the ISPRS WG VI/3 Chair – person and chaired by the Local Host, Prof. G. Forlani.

After the memorial part of the opening session, the ISPRS WG VI/3 Chair - person thanked very much the Academic Authorities of both the Univesity of Parma and the TU of Milan, particulary the first one for the hospitality. Furthermore he gave a special thanks to the distictnes guests, Prof.'s L. Alfano, A. Capello and R. Cassinis, for their contributions in memory of Prof. Mariano Cunietti. Moreover he thanked a lot Prof.'s G. Konecny and K. Kraus, for participating the meeting and giving their contributions. Finally he especially thanked Prof. G. Forlani, for organization of the meeting, and all the speakers and participants of this meeting.

Since fifties, Prof. Mariano Cunietti, after his degree in Physics, was assistant professor of Survey and Mapping, at the Polytechnic of Milan. Then, since sixties, he became full professor of Technical Industrial Measurements, on the chair of the retired Prof. Gino Cassinis (ISPRS President, Rector of the Polytechnic of Milan and Mayor of the same city).

During his long career, Prof. Mariano Cunietti studied gravimetry, photogrammetry, metrology and deformation measurements. He gave an important contribution to the realization of the first Italian gravimetric campaign. Deeply interested in epistemology, he worked a lot in the comparison, dialogue and confrontation between metrology and error theory. Regarding photogrammetry, Prof. Mariano Cunietti was Secretary of the ISP TC III, in the period 1956 – 1960, and 1st Italian delegate in the OEEPE for a very long period. He and his research team at the Polytechnic of Milan participated in many projects with important contributions, assuming sometimes the fundamental role of pilot center.

Prof. Mariano Cunietti was Director of the Institute of Geodesy Surveying Photogrammetry and Geophysics at the Polytechnic of Milan and tutor of several students in the Survey and Mapping, and Metrology Ph.D. Courses in Milan and Turin. Furthermore he was the dean of the Italian Professors of Technical Industrial Measurements and Organizer of twelve Thinkshops on Metrology.

The person of Prof. Mariano Cunietti constituted an interesting figure, with a very suitably balanced mixture of scientist and humanist: he liked and knew literature, arts and music very well. Philosophy and Physics were always present in his scientific activities and he clearly taught the relation between theory and praxis during his fascinating lectures.

The first paper presented was invited paper of Prof. G. Konecny titeled «Mapping from Space». In the introduction, Prof. Konecny pointed out some Italian contributions to the survey and mapping disciplines, e.g. the first perspective, made in the Italian renaissance, by Brunelleschi and Leonardo da Vinci. Successively he pointed out the foundation of Military Geographic Institute in Florence in 1873.

Furthermore he recalled the activities of Umberto Nistri who founded the firm Ottico Meccanica Italiana (OMI) in Rome, producing photogrammetric instruments, shortly after the 1st world war, and of Ermenegildo Santoni who developed innovative photogrammetric instruments at the firm Galileo in Florence, at the same time. Moreover he noted that the firm OMI also produced the first analytical plotter, under Helava & Parenti, at the beginning of sixties.

Finally remembering the figure of Prof. Gino Cassinis, ISPRS President and Congress Director of the ISP Congress of Rome in 1938, he recalled that Prof. Mariano Cunietti was coworker and colleague of him. Thus going to the end of his introduction, he pointed out that Prof. Mariano Cunietti, together with the late Prof. Giovanna Togliatti, evaluated the first space images taken by the Large Format Camera of NASA.

The main topic of his presentation was not directed toward history, but toward the future professional challenges which lie in «mapping from space». Firstly he established a motivation, why mapping from space is important, secondly he re - posted as to what can be accomplished today, for the benefit of the whole humanity, and thirdly he opened the challenged scenario for mapping from space in the future.

The first technical session was chaired by C. Monti. The chair-persons of other technical sessions were: A. Selvini, M.A. Brovelli, B. Crippa, T. Bellone, F. Radicioni, G. Manzoni, F. Migliaccio, F. Sansó, G. Fangi, L. Mussio.

The first technical session dealt with architectural surveying. Some first results of an approach of surveying and mapping sculptures, with digital photogrammetric methods, the

MARIANO CUNIETTI - Varese (Italy), May 8, 1921 - Milan (Italy), July 17, 1997

photogrammetric survey of the internal bearing structures of the Dome of S. Maria del Fiore in Florence and the static control of Palazzo della Ragione in Padua were presented. The contributions showed that digital photogrammetry offers good methods for architectural surveying.

In the next four days of the meeting, other technical sessions have followed. The great number of presented papers could not be reported in details. Some general remarks on presentations and some highlights will be given therefore. However all the invited, presented poster and papers will be published in the IAPRS.

The participants of the meeting learned of the increasing use of WEB in these disciplines. Data transfer, GIS applications, 3D models, etc. can be handled and spread out via Internet. Applications of high interest were done on the cultural heritage architecture. A new automatic, soft classification method for estimation of the blanket of snow, by remote sensing, and mapping of hydro - thermal alteration, by the same techniques, were reported.

Further on, some theoretical considerations on metrology and data processing were presented. A scientist, being the last Ph.D. student of Prof. Mariano Cunietti, went deeply into some concepts of epistemology and linguistics related to metrology (the problem of uncertainty was especially taken into account). An attempt to built up a synthesis, in the field of pattern recognition, showed some contributions, coming both form the linguistics and the AI. Regarding applications, a comparison between a classical geoid and its determination, via GPS, was presented. Moreover a software for georeferencing of digital images by using plane transformations (GeoPlanTran), developed by students, was also demonstrated, as a practical application of digital photogrammetry.

Great achievement of different partners from research centers and from industry, working on the fully Italian mission of mapping from space, regarding satellite accelerometry – SAGE, was presented. There were a lot of organizational and professional problems, but the team whose pilot center was at the TU of Milan, under the leadership of Prof. F. Sansò, succeeded to finish the first part of the project, in only one year. More information are available on the WEB - site, via internet, http://ipmtf14.topo.polimi.it/~sage.

Furthermore a new extraterrestrial mapping, in the framework of the project – GAIA, was presented. The goal of the project is to upgrade the existing star catalogues, by providing a precision catalogue of one billion stars, using high resolution measurements with micro – arc second astrometry from space.

The use of an automatic DEM generation in quarries, the establishment of a precise leveling network, for the monitoring of possible vertical movements in Pisa and in its surrounded area, and some surveying methodologies suitably applied in volcanic regions, like the Phlegrean district (near to Naples), are interesting topics, presented in the field of deformation monitoring.

Prof. K. Kraus lectured a current topic, namely «Determination of terrain models in wooded areas with airborne laser scanner data». Airborne laser scanners for recording topographic data are ready to be used in various applications. He reported on experiences acquired during the pilot project, comparing photogrammetry with laser scanning from the user's point of view. Laser scanning is the dynamic method of data acquisition, with laser rays from airborne, and is especially suitable for measurements, to obtain terrain models in wooded areas. It is necessary, to use GPS and INS during the laser scanning, in order to be able to define the position of ray origins. Thus the geoid undulations of the area are required.

Laser scanning supplies data with a skew distribution of errors, because a portion of the supplied points is not on the terrain, but on the treetops. Thus the usual interpolation and filtering has to be adapted to this new data type. He reported on the implementation of this new method which bases on linear prediction algorithm and works iteratively, taking into account robust estimators. He concluded that laser scanner data provide DTM's, in wooded areas, with an accuracy equivalent to photogrammetry DTM's, in open areas, derived from wide-angle images of scale 1 : 7000. In flat terrain, the accuracy is + / - 25 cm. After further improvements in the data processing, an accuracy of + / - 10 cm can be achieved for laser DTM's. With a special filtering and interpolation method, an automatic classification of the laser points, into terrain and vegetation points, is possible.

The participants heard also of the use of GPS, GLONASS and other systems used for real – time positioning in Italy. A historical overview was given by Prof. G. Manzoni. Prof. F. Sansò added some comments on the current state in this field in Italy. Big powerful industrial firms are prepared to invest for establishing more permanent GPS stations in Italy. However not only money is needed, but also proper professional solutions must be considered as well.

The two last technical sessions dealt with digital photogrammetry and it's usage for camera calibration, restoration purposes, architectural photogrammetry, historical studies (an ancient perspective in Lecco has been analyzed and matched with a new survey). In this frame, biologists showed the first results, concerning a special type of image processing, of the participation in the gene functional mapping project.

The business session was chaired by the ISPRS VI/3 Co - chair - person. Firstly a short overview of the working group activities was given by Chair - person. The working group has around 280 members, between participants and correspondent members, involving 46 countries (around the half of the ISPRS ordinary members). Consequentially one can say all the meetings (Padua (Italy), February 3-7, 1997; Bahia Blanca (Argentina), October 27-31, 1997 and Perugia (Italy), February, 16-20, 1998) have been a full success.

Successively it was pointed out that an official meeting was originally scheduled, in the first week of February, at the University of Cape Town (South Africa). This meeting in Italy (Parma) would represent a repetition, because the two places are far enough. Unfortunately, unpredictable and undesirable difficulties and troubles in Indonesia imposed a delay of one year, the ISPRS TC VI Mid Term Symposium.The ISPRS Council canceled the Meeting in Cape Town, because of an evident conflict of date. However the ISPRS WG VI/3 staff obtained a new official meeting to be held, in the second week of December 1999, in Cotonou (Benin, Africa).

M. Kosmatin Fras presented the preliminary program of the last meeting of the WG VI/3, before the Amsterdam Congress, in Ljubljana (Slovenia), February 2 – 5 , 2000. The organizer of the meeting is the Section of Photogrammetry and Remote Sensing of the Asssociation of Slovenian Surveyors, together with the WG IV/3: «Temporal Aspects and Data Revision», co – chaired by Prof. F. Crosilla. In the two days before the meeting, some tutorials will be organized.

At the end of the business session, L. Mussio reported that an Italian Delegation for Geodesy and Geomatics will be established, by the CISM in Udine, which delegates will participate in the meetings of Ljubljana and Amsterdam.

Although the participants of the meeting in Parma were mostly Italian, the spirit of the working group to transfer knowledge, work interdisciplinary and offer stages for young people was felt again. In addition to the working part of the meeting, participants had also some time free to discuss, during the coffee breaks, to see the famous monuments of Parma and to enjoy meals in numerous small, domestic taverns and restaurants, serving tasty local and national dishes.

The chair-person closed the meeting, recalling the very strong figure of Prof. Mariano Cunietti. He summarized that the participants had one week of hard work, interesting discussions and nice events. He was sure that the meeting had been fruitful and positive for all participants, recognizing the importance of the international cooperation and technology transfer. He hoped to meet all the participants again in Cotonou and / or in Ljubljana and, last but not least, in Amsterdam.