ICA efforts in Map Design and Production

by Ernst Spiess

If we are to evaluate the effect ICA had in this period of 50 years, we have to look into its manifold activities. The results of conferences and meetings are recorded in publication form and in our personal remembrances. An important assessment of these events can be found in the many reports published in the cartographic journals of the national societies. In the initial phase until 1974 papers were partly published in the «International Yearbook of Cartography». To mention only two relevant examples: Carl Mannerfelt himself described in the first edition up-to-date drawing and reproduction techniques as used for the Swedish National Atlas. Another article, often referenced to later on, was Eduard Imhof’s fully illustrated contribution on name placement.

The most extensive source of information, however, is the wealth of abstracts and papers of the individual presentations at the conferences up to present times. During conferences the time needed to separate the wheat from the chaff is usually lacking. But looking back you will find in this collection an enormous treasure. More recently, conference papers are now made available on-line through the ICA-homepage. No doubt this material is a very valuable source of the state of the art in present day cartography and related fields. The contributions more and more make use of the possibilities of the web, including illustrations so much missed through the last five decades.

The impact of all the exhibitions of maps, atlases and commercial hardware and software is not to be neglected. What visitors got from displays, demonstrations and personal contacts has certainly influenced in many cases their own ideas and their dispositions. Much of what they saw and discussed will have been stimulation and impulse for their own activities.

Somehow more focussed on special items are the commissions and working groups. They periodically presented their reports about their work going on and about new techniques or concepts. Much more widely spread, also outside ICA, are the ICA-publications, initiated and produced by the commissions and also the publications on the technical standards on spatial databases collected, systemised and published by the respective commission under the editorship of Hal Moellering. The content gives a comprehensive summary of the respective activities in those countries, which participated in the commission work.

To the surprise of many the first thing needed in international co-operation was to find a common terminology to understand each other, apart from the serious language problems. The «ICA-Multilingual Dictionary» was an important step to remedy this situation. It would be an exaggeration to say that due to the Dictionary it is no more a problem nowadays. The increasing influence of the dominating English computer terminology has contributed quite a bit to alleviate this problem, but for every member of a non-ICA-language community it remains sometimes difficult to communicate his ideas and to make him understandable.

The first initiatives of cartographers to exchange technical information on map production took place at the Esselte-Conference in Stockholm 1956 and at the meeting at Rand McNally in Chicago, in 1958. Scribing and strip-masking techniques had been recently developed at different places, but were not yet common at all in many others at that time. The intention to share technical experiences was certainly one of the motives of the foundation of an international association.

Under the suggestions for the creation of special commissions the first General Assembly in Paris in 1961 we find two proposals, «Techniques and equipment for cartographic drawing» and «Recent developments in the field of cartographic reproduction techniques». The report of the Frankfurt
conference 1962 mentions for the first time «Automation» as one of the three main topics, referring, however, only to improvements in reproduction techniques. A milestone in the development process was David Bickmore and A. R. Boyle's report on an experimental unit for digital mapping, together with the first samples of maps drawn on a cathode ray tube presented by Waldo R. Tobler. These contributions found great interest and were certainly one of the motives for the creation of an «ICA-Commission on Automation» by that General Assembly. In the following years the commission, in spite of its vast catalogue of terms of reference concentrated more and more on experimental digital mapping. This led to the formation of a Commission on Map Production at the General Assembly in Ottawa 1972. In the next two decades there was an ongoing controversy on which subjects belonged to which commission, because automation more and more was involved also in analogue processes.

In 1973 a group of experts from 18 countries started discussion about an exhaustive inventory of cartographic techniques. It was not easy at all to attain a systematic approach due to the different levels of experience and technology of the commission members. Still more problems were encountered in the formulation of a comprehensive definition in English and French for each process, starting from proposals in different languages. These difficulties continued during the preparation of the «Compendium on Cartographic Techniques». The idea to involve volunteers from all over the world and develop the manuals by international co-operation was condemned to compromises, lack of co-ordination and loss of time. Also some of the illustration material did not meet sufficient standards, which gave cause to unpleasant rejections. Fortunately, the editor of the final edition, James P. Curran was in a position to remedy English language problems as well as technological defects. Later, the Commission started a project on workflow diagrams. The aim was to create a visual means to describe the rather complicated analogue and digital processes of map production, starting from various sources, followed by map compilation, map construction, map reproduction and final printing. It was conceived as a tool for map process design, quality control as well as for education. The system has been presented by Sjef van der Steen at the Conference in Barcelona in 1995.

Another ICA-publication, which found reasonably wide dissemination, was the manuals «Basic Cartography for Students and Technicians». The individual chapters were attributed to members of different countries, who partly involved their corresponding national commissions in the conception and preparation. The traditional drawing and scribing techniques shown in detail in the first volume were a valuable guide for apprentices for scarcely more than ten years. For countries, where they might have been welcomed, the books were just too expensive.

What had started as automation in cartography developed rapidly into computer-assisted cartography, further to digital and to web-based cartography. Numerous papers, reports and demonstrations described the on-going change. The topics covered every aspect of these new technologies: New equipment, automatic mass digitizing, scanning, drum scanners and plotters, map publishing, vector and raster data conversions, computation of map projections, automated generalization, proof printing, printing on demand, computer-to-plate printing, web mapping and many others were the headlines of an enormous wealth of contributions. Which ones were milestones in this cartographic revolution, and to what extent, would be the subject of a definitely more thorough study. It must be mentioned at this point that the main part of this revolution might be due, unfortunately, to the commercial firms, developing equipment and software, however, primarily not for cartography. But there are several indications of improvements for cartographic applications that originated in discussions with ICA-commissions and objections raised during ICA-exhibitions.

An early initiative in map design was the attempt of a standardization of map symbols in maps. At the time these proposals were partly welcomed, when based on a well-structured classification. But if we are honest, we would not like to use those symbols nowadays, first from a graphical point of view and
second because the same object may appear in maps in completely different contexts. Nevertheless the design of symbols and their standardization is still a common theme today.

Another issue of map design that attracted the cartographers’ attention from the beginning is colour in maps, including the design of colour atlases for choosing tones and tints for process colour printing. Already at the conference of Amsterdam in 1966 a special session was devoted to colour. Countless are of course the moments in all the 22 conferences, when colour became part of a presentation. Relatively rare, however, were contributions concentrating specifically on this item. The five books produced by the Commission on Education and Training have been an extremely valuable source for various aspects of map design as well. They include communication, theory of cartographic expression and design, visualisation, map compilation, generalization, toponymy, computer-assisted cartography etc. Of course these manuals concentrate more on the fundamentals in contrast to many sophisticated papers at the conferences. The constraint to illustrate map design and reproduction in black and white only, due to limited financial resources, is a real handicap for these books. The benefit of colour for explaining rules and concepts in map design is shown by the figure.

Visual perception and presentation with respect to map design have appeared as a topic at most ICA-conferences. The various schools tended towards a general agreement about the fundamentals of visual presentation and related terminology. Entirely new aspects of visual presentation had to be taken in mind with the advent of web-maps. Besides static view only maps there are now dynamic ones with a variety of interactions. Various contributions have insisted on the need to extend the graphic variables with a set of dynamic visualization variables to be used on displays.

If we compare the well-established theoretical state of the art in design with the actual production, the transfer into practice seems to have failed up to now. We are left with the fact that the messages have not yet reached all old and new players in cartography. The ICA community has the potential to remedy this situation. In the Fifties cartography was a worldwide scattered group of academic and production units, often hiding their procedures and techniques like secret services. Since then ICA with all its activities has transformed the whole field into an open society. The flow of information is remarkable and all the professionals involved gain from many personal contacts. Therefore if we look back, the ICA is a story of success in spite of its limited resources. Our best wishes shall be with the Association for its future.