

Headphones were supplied to those who wished to listen to the simultaneous translations from English, but those who understood English did not bother to collect these and therefore sometimes found themselves unable to understand those speakers using an 'unofficial' language.

It is of course impossible to mention the contents and quality of each of the many lectures and posters; almost every subject was covered. Some of the review lectures of key areas were very informative and Dr Vincenzini must be congratulated on having assembled presenters for such a vast amount of information. The proceedings of the congress will be published by Elsevier, North Holland in 2 volumes running for several thousands of pages. The prospect of being able to read the contributions one missed is eagerly anticipated, although with some trepidation about the cost of the publication.

One has to ask oneself whether meetings on this scale are desirable. I remember an American colleague saying to me at an American Ceramic Society Meeting when I mentioned that the trouble was that I would like to be in three places at the same time: 'I am not coming for the lecture, I come to meet people and see the exhibition'. This brings me to the small exhibition which, save for the stand by ASEA on isostatic pressing, was really not very interesting. The main reason for this is that the high technology activity in Italy is almost non-existent and potential foreign exhibitors would therefore consider the cost involved as a bad investment. Meeting people was not particularly easy. One usually saw people one would have liked to talk to rushing from one lecture location to another. There were no coffee or tea breaks, although there was some opportunity to meet people at the very pleasant evening receptions. However, these were more of a social occasion and in any case one was so exhausted by the end of the day (it was very, very hot outdoors) that one kept one's conversation away from ceramics. The congress was concluded by a very pleasant dinner in the Cloisters of St Francis a charming location in alta Bergamo.

In conclusion, the reviewer has formed the opinion that meetings on this scale should only be held if accompanied by a worthwhile exhibition of high technology ceramic materials and equipment for their R & D and production; and this can only be achieved in a country with high activity in this area.

PM 86 INTERNATIONAL CONFERENCE AND  
EXHIBITION, POWDER METALLURGY  
DUSSELDORF, FRG (7-11 JULY 1986)

Because the programme indicated much subject matter of relevance to high technology ceramics, the reviewer decided to attend this conference; after

all, powder metallurgy and ceramics are both based on the same technology and the science of sintering, and cross-fertilization conceives better products than in-breeding.

As this meeting followed very soon after the World Congress on High Technology Ceramics (see above) comparisons come to one's mind. The two meetings were roughly of the same size but this meeting was accompanied by a very impressive exhibition in which there were not only approximately 150 exhibitors with their individual stands but many of these collaborated in a 'state-of-the-art' show covering subjects such as tools, engineering, transport, electronics, etc.

The organization can only be described as superb. On registration one was handed amongst other interesting information 2 volumes of 'Horizons of Powder Metallurgy' running in total to 1345 pages and containing preprints of the papers to be presented. There was also a list of the 620 registrants, covering 36 countries. Most delegates came from the FRG (132), the USA (70), Sweden (64) and Japan (60). The technical programme was covered by 12 plenary lectures, five of which were of definite interest to ceramists; of the latter the review 'New Ceramic Materials—a Challenge for Powder Metallurgy' given by F. Aldinger of Hoechst was outstanding. The remaining 300 plus contributions were covered by what appears to be a new concept, i.e. 'theme zones'. There were 25 altogether, covering: powder production, cutting materials, applications, new shaping methods for components, HIP and joining quality control, new materials, sintering, etc. Three or four theme zones were held simultaneously in different rooms. Between 10 and 20 posters were displayed for a whole day in each theme session. At a set time, all authors of a session assembled around a table and were introduced to the delegates by the chairmen. Authors then moved to their exhibit and were given 45 minutes for individual explanations and discussions. Thereafter, all authors went back to the podium for a further public discussion.

Another new feature was 'students' day'. On one day, students were given free access to the conference and exhibition. Two special lectures entitled 'Why PM?' and 'Examples of Applications of Modern PM Materials' were presented to them. Another day was designated 'users day' when a planning discussion was held with a panel consisting of important industrial users.

One's general impression was that there was much common ground in the handling of metal and ceramic powders, i.e. characterization of powder milling and mixing, granulation, forming equipment, sintering, and micro-structural evaluation. Whilst powder metallurgists seem to have only just woken up to consider the ancient ceramic art of slip casting, they are ahead in non-destructive inspection methods, particularly in the evaluation of density distribution by computer tomography using  $\gamma$ -rays. Freeze drying

was proposed as a forming method but one learned that the problem of die wear was rather serious with ceramic powders.

The organizers, the 'Ausschuss für Pulvermetallurgie' under the chairmanship of Prof. Dr G. Detzon, and the programme committee under Dr W. J. Huppmann must be congratulated for having arranged a most interesting programme for  $4\frac{1}{2}$  days.

The social event was a cruise on the river Rhine.

**Paul Popper**