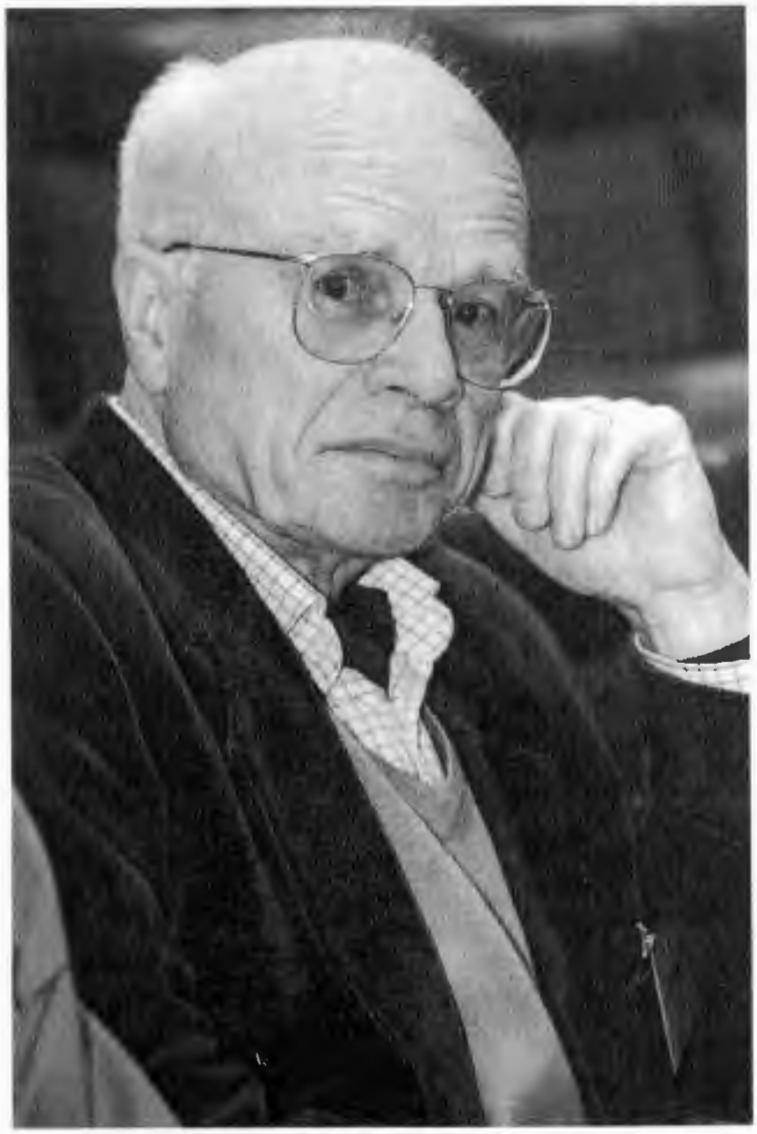
Preface

This volume contains papers presented at the International Conference "Diffusion, segregation and stresses in materials – DSS-02" which was held May 27-31 at the Moscow State Institute of Steel and Alloys (Technical University) in Moscow, Russia. This conference was the child of two "diffusion parents" – Dezso Beke and Lindsay Greer. It was born at the lake Balaton, in Hungary, in 1995. It was the first international conference on diffusion and stresses. Afterwards, the child was nursed in Moscow, at Moscow Steel and Alloys Institute exactly five years ago, in 1997. It was the conference on diffusion and segregation. After lengthy discussions, where many people took part in, it was decided to hold the new conference devoted to both these subjects, and everyone agreed to that idea. However, not everybody was able to work on it. The expected place of the conference was constantly moved from Hungary to England, and at the end, we all have got together in the remarkable city of Moscow, the city which – if it has not noticed yet – got more beautiful during the past five years.



Prof. J. Philibert

We would like to express our gratitude that all participants found time to come to Moscow, despite the fact that they are the very busy people. We were very glad to see us all together at this – third – conference dedicated to diffusion, segregation and stresses in materials. Our world is flogged with information. However, nothing and nobody can substitute the joy of simple human communication. Nothing can be as effective for good of science as this one where we can discuss

the topics of common interest either listening carefully or interrupting each other, either remaining calm or waving our hands impatiently. Actually, this is the main reason of our gathering.

As it always happens at organization of such small conferences, it was originally decided to keep it as a workshop, and to narrow down the topics: only grain boundary diffusion, or only segregation or only stresses. However, as we were moving on and as a result of your suggestions, it became clear that the boundaries of nowadays science are vast and to narrow it down is unnecessary and useless. Nevertheless, we have tried to define some topics of the workshop such as: diffusion and stresses, diffusion and phase transformations, general problems of diffusion in condensed media, especially in polycrystals, grain boundary diffusion and grain boundary segregation, diffusion processes in nanostructures and in thin films, diffusion and related phenomena (sintering, intergranular brittleness, superplasticity, oxidation, etc.). Many of these problems were suggested by prof. Jean Philibert who, one of the first, responded to our request to name the possible questions to be discussed. Besides he agreed to be the moderator of a free discussion on Wednesday, the 29th of May, starting from 4 p.m., some kind of "round table" of topics on the nature of segregation and mechanism of grain boundary wetting. So, as you can see it yourselves, having looked up the program, all reports at this conference connected with each other through the words such as diffusion or diffusion controlled processes even though that as a whole they differ significantly. As a result, 90 oral talks and posters were presented at the conference, and the size of this volume, with more that 300 pages reflects the present interest in this field. The posters presented at the conference were analysed in survey reports. As we have mentioned before, the main purpose of this conference was to create a time and place where we could quietly and unhurriedly discuss the topics of common to us interest. That is why the number of the oral reports was relatively small and each of the speakers has got 30 minutes.

The conference was took place at one of the best technical universities of Russia, the best at least in the field of material science and metallurgy. During different days of this conference students of different levels (undergraduate, graduate, postgraduate) attended the meetings, some of the students were from their first year. We liked it very much and we firmly believe that their experience of participating in this first for many of them international meeting will remain in their memory for a long time and will play a very important role in their life. In such a way the tradition of investigation of diffusion in Russia will have its continuation.

At the conference there were the participants from 15 countries. Outside of Russia and Ukraine there were scientists from England, Estonia, Israel, Italy, France, Germany, Japan, Holland, Hungary, Poland, South Africa, Spain, and Sweden. It was a pity that the colleagues from USA were not there. They were actively participating in the discussions at the first stages of preparation (a year ago), however, to our target, the tragic event of 11 September of last year did not pass without a trace. Outside of scientific agenda, some informal meetings were offered to the participants like welcome party, conference banquet and program for accompanying persons. This program included the sightseeing tour of Moscow, visit to Moscow Kremlin and Arms Chamber, the trip to the famous monastery at Sergyev-Posad and also visit to Tretyakov's gallery – the remarkable museum of Russian art of different époques, from icon painting to nowadays.

Participation of such a great number of leading scientists from all over the world was very important to us, since we pay so much attention to widening of the world educational and scientific cooperation. The sponsorship of the INTAS (the INTAS monitoring day was also included into the workshop program) and the Russian foundation for basic research is greatly appreciated.

Boris Bokstein
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