

## Preface to the Second Edition

It is a truism to state that much has changed for the Moscow mathematical community in the almost twenty years since the idea for this book was conceived and we approached about forty mathematicians in the Soviet Union for contributions. Some accepted, others did not reply, and some declined with an apology that times were too uncertain for them to be completely open about airing their views.

In the meantime, many have emigrated, others remained, but the contacts between the first and second groups are more numerous than anyone could have anticipated in the early 1990's: some of those who emigrated return regularly to Moscow for seminars, teaching and conducting research, and some of those who remained go to conferences, sabbaticals and other visits abroad. This intermingling of Russian mathematicians with those from outside of Russia has had several consequences for mathematics, both within and without Russia. Thus, to mention but one example, we see in the U.S. (say, at UC Davis, or Penn State) the organization by Russian mathematicians of "mathematical circles" as a method for training high school and undergraduate students by their slightly older peers, as was common in Russia (see footnote on p. 143).

When we were asked to prepare a preface for this second edition, it seemed natural to solicit an update by a Moscow mathematician. V. M. Tikhomirov graciously agreed and contributed on very short notice the beautiful article "On Moscow Mathematics—Then and Now", which is much more than an update, giving us an overview of 20th-century Moscow mathematics.

Reading this account was like a trip down memory lane. We hope it will provoke the same reaction from those who have experienced Moscow mathematics in that period, and, for others, that it will provide some flavor of what it was like to be there.

Tikhomirov sent us his article just before the 2006 International Congress of Mathematicians in Madrid began. So he had no way of knowing that out of the four Fields medals in Madrid, two would be awarded to mathematicians born and trained in Russia, one of them in Moscow. One of them has remained in Russia, and the other lives and works in the U.S. but has kept close ties with mathematicians in the old country.

So we join our hope to that of Tikhomirov and many others that the new century will be as productive for Moscow and Russian mathematics in general as the preceding one was.

In addition to the new article by Tikhomirov, this edition contains an index of names and a short list of errata. We are grateful to V. I. Arnold, who sent a whole page of corrections as soon as the first edition appeared.

Smilka Zdravkovska and Peter Duren  
Ann Arbor, September 2006

## Preface

The idea to put together a volume like this one occurred while I was reading an article on A. A. Lyapunov in the Russian magazine *Priroda* (Nature). Even though it was written with a somewhat heavy (for Western taste) dose of turgid sentimentality, the stimulating atmosphere of the Moscow intellectual circles was almost palpable. I mentioned this to Bill LeVeque, who was then Executive Director of the American Mathematical Society; he immediately liked the idea that the AMS publish such a volume, and he contacted Peter Duren, the Chairman of the AMS History Committee, about it. For various reasons, the project has dragged on for almost five years. Originally, it was to be coedited by Allen L. Shields and myself: his encyclopaedic knowledge, which included—but was certainly not limited to—Russian history and culture, and his global interest in mathematics, which is what one seems to mean when talking about “Russian flavour” in mathematics, made him an ideal person for the undertaking. Unfortunately, Allen died on 16 September 1989. At that point, for me, most things seemed irrelevant. Fortunately, Peter Duren had by then become a coeditor, for which I am deeply grateful. Without his crucial contribution, this volume would not have appeared.

The collection was first intended to have wider scope and something like “Soviet Mathematics; Recollections” as a title. But as the articles actually accepted all focused on Moscow, the current title seemed more appropriate.

The revolutionary changes in the past few years have affected this volume in several ways. I will mention just a minor consequence: whereas originally we were going to use the Mathematical Reviews transliteration of Russian names, this became impossible, with many of the mathematicians travelling abroad and using Western versions of their names and some insisting on using specific spellings for various people mentioned in their articles. So we had to resign ourselves to inconsistent spellings of names. Another inconsistency is in the translation of the Russian words *fakultet* (department), and *kafedra* (section in a department), which variably occur as Faculty, School or Department for the first, and Section, Chair or Division for the second. Finally, let us mention here two terms that often appear in this volume: “Candidate’s degree” which corresponds to a Ph.D. from a university in the United States,

and “Doctorate” which is much more difficult to obtain.

I was very fortunate to be an undergraduate student at the Mathematics Department (Mekh-Mat) of Moscow State University in the 1960s. I will never forget this exciting *milieu*, where one would learn at least as much from fellow students and those slightly older or younger than oneself as one would from the professors. After the first two years, one had to choose a *kafedra* and an undergraduate advisor under whose guidance one would write the undergraduate (research) thesis in the fifth year. One could pick for credit from among literally dozens and dozens of courses and seminars, most taught or conducted by first-rate mathematicians. One passed the knowledge on to (and learned from) the bright high-school children in the mathematical *kruzhoks* (circles). And of course mathematics was but one of the many interests (though maybe the major) of the groups bound by close friendships.

A marked chill in the atmosphere was felt in 1968, after 99 mathematicians signed a letter protesting the treatment of Esenin-Volpin (this is explained in several of the articles in this volume; see, for example, the articles by Fuchs (p. 220) and Sossinsky (p. 235)). Obtaining permission from all the cosignatories to publish their names here was too daunting a task, so this tempting idea had to be dropped. This letter with its signatures is published in *Sobranie Dokumentov Samizdata* (Collection of Samizdat Documents), Vol. 1, AS No. 20 (available at the University of Michigan Library, for example), so the interested reader might want to look it up. Any mathematician will readily recognize most of the names.

It seems that the decline of Mekh-Mat has been constant since then (see an article by S. P. Novikov about it in *Moscow News*, February 18, 1990). That, along with the possibility for travel and emigration of the top mathematicians, has threatened the very existence of Moscow mathematics as described here. So it was with joy that I learned of the creation by a group of enthusiasts<sup>1</sup> of the Independent University of Moscow (IUM). It started in the Fall of 1991, comprising just a mathematics and a physics departments. The mathematics department has fifty students (all in the freshman year; each year an extra year is planned to be added), hand-picked by leading mathematicians after a competitive examination.

The IUM is currently housed in a high school which lets the IUM use its building in the evening, after the regular students have left. Evening classes are a necessity also because the IUM students for the time being must also be enrolled in some other educational institution in order to obtain draft postponement. Three courses were taught this past year: Algebra (by Rudakov), Analysis (by Kirillov and Vassiliev) and Mathematical English (by Sossinsky). All this is done on a practically voluntary basis.

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<sup>1</sup>The Scientific Council of the Mathematics Department of IUM consists of: V. I. Arnold, A. A. Beilinson, R. L. Dobrushin, B. A. Dubrovin, L. D. Faddeev, A. A. Kirillov, A. G. Khovanskiĭ, S. P. Novikov, A. N. Rudakov, Ya. G. Sinai, M. A. Shubin, and V. M. Tikhomirov, N. Konstantinov serves as Acting Dean.

The founding of IMU is a very important first step, in Arnold's words, in the attempt to solve the problem of conserving and regenerating the cultural potential of Russia. It should lead to more golden years of Moscow Mathematics.

Smilka Zdravkovska  
Ann Arbor, 6 June 1992

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