5. R. Nelson, *The Sources of Economic Growth*, Harvard University Press, 1996. See also my review in *Prometheus*, 16, 4, 1998, pp. 535-7.

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From Central State to Free Global Market Economy

C. Corsi, S. Kudrya and C. Cardone (Eds)

Dordrecht, Kluwer, 1997, xiv + 196 pp., US\$115.00, ISBN 0-7923-4520-7

This is another book from NATO's ASI (Advanced Science Institutes) Series on Science and Technology Policy which comprises the proceedings of the workshop on 'Moving from Central State to Free Market Economy', held in Moscow in November 1995. The chosen title does not fully represent all the aspects of the meeting and hence, the papers included in the book. Although a number of contributions focus on the transition from centrally planned to market economy, there are also papers which deal with issues only remotely relevant to the problems faced by the former socialist countries. Another important aspect of the workshop was the application of telecommunications and information technologies (13 of the 20 articles in the book deal with such issues). The publication contains a lot of challenging concepts, interesting case studies and practical experiences, but the editorial work is hardly at the same level. The papers are not organised in chapters and the one and a half page preface provides some background but does not highlight the contributions from the workshop. Being a conference proceedings, the responsibility for the accuracy of language and editing has apparently been left to the various authors. This has resulted in cases where the reader experiences significant difficulties, e.g. understanding the crucial abbreviation RTD in the paper by Vacca which aims to describe RTD, or looking for the missing 'solid' and 'dotted' lines in the paper by Kozlov. The book, nevertheless, contains some valuable concepts and practical solutions as well as description of developments in the field of science and technology policy.

The articles included in the book can be loosely grouped under six topics: science in Russia (three contributions); small- and medium-sized enterprises (SMEs) in Russia (three contributions); information technology (IT) and globalisation of innovation (four contributions); IT and SMEs (four contributions); local development (three contributions); and science and technology policy (three contributions).

The political and economic changes in the 1990s had a very significant impact on science in Russia. The catastrophic reduction of funding that occurred in 1991–1992 and resulted in a drastic decrease in the number of researchers and research organisations has been followed by a period of stabilisation. International foundations, such as the Soros' International Science Foundation and the European INTAS, Copernicus and Peka programmes, play an important part in fund allocation for civil research. The military complex is, hence, the most affected by the cuts. The comparative data provided by Kozlov, however, shows that Russia's military R&D expenses are still very high as a percentage of total R&D expenses (i.e. 54%) and higher than any OECD country. The Russian Academy of Sciences and the various government research institutes are underfunded and face serious difficulties in providing information links to the rest of the global research community (see the article by Mindeli and Gubanov). The tertiary sector

has had to adapt to contracted research funds and a new role in providing services to industry. The article by Paramonov and Kolesnichenko emphasises this need and gives some examples of cooperation. Nevertheless, their solution that academic departments should act as innovation centres seems to me to be open for discussion.

The number of SMEs in Russia has increased from 8,000 to 60,000 between 1991 and 1993 but the absolute number of innovative enterprises has been cut in half because of reductions in state funding and the reluctance of the new entrepreneurs to take R&D associated risks (see the article by Kudrya). Cardone explains that this situation has been exacerbated by the Russian tradition of state control, which continued unbroken from tsarist years to the soviet era. The total lack of collaboration and exchange with the West during these times makes the transition to a market economy even harder in terms of developing a western-type culture for innovation. Vorobieva focuses on the role of the government to save Russia's technological strengths by providing assistance for small innovative companies. Examples of such help are: regulative support for small entrepreneurship; the introduction of a 'currency corridor' with a fixed exchange rate of the rouble to the US dollar; and provision of access to information.

The globalisation of innovation nowadays is greatly facilitated by communication networks and other computer and IT developments, such as CAD/CAM systems. Corsi looks at the explosion of the Internet (including Eastern and Central Europe) as a case of 'cooperation in competition' and one of the best tools for socio-economic transformation. Da Costa Pereira develops the concept of small countries being in a better position to capture the benefits from foreign research through international trade. He concludes that even if the opening of the markets seems to have a stronger effect than the application of telecommunications and IT, these technologies have proven to be very powerful in putting people together. Murray's statement that Scotland's experience in developing a world class cluster of electronic companies can be applied to other countries with only minor modifications is highly arguable. His article, however, makes a strong point that quick reaction to diverse customers' requirements is essential for commercial success, and that IT and CAD/CAM systems provide improved communications and practical solutions. Competition and cooperation in research is the focus of Kreul and Gorak's article. Their emphasis is only on the technical aspects for cooperation, such as common technical language. No consideration is given to social factors and the examples lack some valuable information for researchers in the social sciences.

The two very interesting articles on virtual companies (by Hauges and Robson) are indicative of what IT can do for SMEs in avoiding the problems related to size and lack of skills by tying small companies into a network and achieving the advantages of large companies. The examples include the Norwegian consortium for the 1994 Olympic Games in Lillehammer, Rolls Royce plc and the knitwear industry in Emilia Romagna, Northern Italy. Vacca describes the design requirements for an information and consulting system which can facilitate technology transfer to SMEs. A similar concept has been developed for around 30 years by the French government agency for promotion of innovation and technological progress ANVAR. Batail details ANVAR's experience which covers the unique 'minitel' system as well as the use of information highways and teleports. Assistance has been provided through the Agency's national and regional centres.

Cooperation between industry and government is a distinctive feature of local development. Coburn *et al.* provide an historical overview of the cooperative technology programmes established at state and federal level in the US as public-private initiatives with the goal to enhance economic development and support the growth of technology-based companies. The future of the federally sponsored projects is uncertain in a regime

of budget reduction; in contrast, the interest at the state level remains very high because of the benefits such programmes produce for regional development. The science parks initiative is another form of industry-government (including university) involvement aimed at promoting development in particular localities. The two main functions of the STPCal (Science and Technology Park of Calabria) in Southern Italy described by Corti *et al.*, are to supply a variety of services, a lot of them information based, and to contribute to the creation of new innovative enterprises. The way the park's information system operates is not only to distribute information but also to help in solving problems of individual occupants of the park. Botteghi sees local development as a remedy to short falls in traditional policies and as an opportunity to search for new strategies.

The three papers forming the group of science and technology policy are very different in nature. Daukcev's technology transfer policy recommendations for Kazakhstan are based on a diffusion model taken from the physics of the solid state and require more discussion of its limitations and interpretation. Coletti's paper is about the underlying policy concepts behind planning and designing of major national infrastructures, such as information networks. In the case of the Internet, for example, the main priority has been openness; data transmission and data integrity being secondary features and security the final one. His view for science and technology policy is that it is important to identify realistic R&D goals. Issues, such as moral standards, production and quality criteria, management and necessary infrastructure should be considered in advance. Szántó's paper deals with definitions for technology policy and science policy. His belief is that they are separate, with science policy creating conditions for 'human curiosity and compassion' (p. 102) and technology policy assisting 'the continuous creation of technological advantage and its market implementation' (p. 101). He does recognise, however, that there are links between the two and gives the example that when technology policy does not exist, science policy can often lack real content and aim.

The usefulness of NATO's Science and Technology Policy workshops is reflected in the number of interesting individual contributions in the book. The informal discussions held in Moscow were probably just as valuable. As the reader cannot benefit from the latter ones, the editors should put more effort into bringing the publication of the proceedings up to the expected academic standards.

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Scientific and Technological Achievements Related to the Development of European Cities

Sergei Radautsan and George Parissakis (Eds)

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This book, the ninth in NATO's 'Science and Technology Policy' Series, contains the proceedings of a NATO Workshop focused on the problems of contemporary cities and the role of science and technology in their development. The workshop, held in Kishinev, Republic of Moldova, on 22–24 May 1996, was sponsored by NATO's Science Committee within NATO's Science & Technology Partnership in Priority Areas. NATO's program is aimed at the dissemination of advanced scientific and technological knowledge between NATO countries and its Cooperation Partners, and at strengthening