

of Sciences. The author of the essay on Vinogradsky, G. A. Zavarzin, claims that he “continued to take an interest in scientific life in Soviet Russia”, which meant maintaining friendly relations with the bosses of Soviet science, in contrast to other Russian émigrés. But this singling out of Vinogradsky is perhaps unjustified. As the other essays in this book show, most émigré scientists remained Russian patriots and helped many of their friends who remained in the USSR. They simply could not reconcile themselves with the morals and behaviour of the communists. They condemned the repressions and terror in their motherland, and tried to avoid the retribution of the Bolshevik hangmen.

Other Russian émigrés featured include Vladimir A. Kostitsyn, an astrophysicist who

also worked in mathematics and ecology, the mathematician Dmitry P. Ryabushinsky and Chichibabin, who all emigrated to France. Also profiled here are geneticist and evolutionist Theodosius G. Dobzhansky, mathematician Yakov (Jacob) Tamarkin, engineer Stepan P. Timoshenko and Ipatiev.

The final section is devoted to biographies of eminent specialists in the fields of economics and the humanities: the Nobel laureate Vasily Leontiev, the historians Rostovtsev, Georgiy Vernadsky and Pavel Milyukov, and the philologist Roman Yakobson, a Harvard University professor who had great influence in many fields of the humanities.

The book is full of detailed descriptions of the degrees, prizes and awards bestowed on the subjects of the essays, but unfortunately

there are no name or subject indexes and no bibliography. Only some of the authors indicate the sources from which they obtained their materials. These materials would be useful not only to researchers of Russian history, but also to show more fully how the history of Russia was viewed in the West.

Nevertheless, this book is the first work in which the lives and activities of representatives of those who achieved significant success during their lives outside Russia are discussed without any political subtext. Although it is primarily addressed to a Russian audience, it would be good to see it translated into European languages. ■

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## Science in culture

### Shingu's showers

#### Technology and nature at Fiat's Lingotto factory in Turin.

Martin Kemp

On the face of it, there seems to be something incompatible between high-tech components in gleaming metal, obviously precision-engineered, and an insistence upon a total harmony with nature in all its living complexity. But any incompatibility is triumphantly dissolved by the kinetic sculpture of Susumu Shingu, the Japanese constructor of devices driven by natural forces.

His large-scale constructions grace public spaces throughout the world, including Queens Criminal Court in New York and the New England Aquarium in Boston. His travelling installations of sculptures, *Windcircus*, which toured urban sites in the late 1980s, and *Wind Caravan*, which was encamped in stunning natural locations in Japan, New Zealand, Finland, Morocco, Mongolia and Brazil during 2000 and 2001, are at once forceful and light, strong and elegant, large and delicate — evoking the power and sensitivity inherent in natural systems.

There could be no more telling context for him than Fiat's classic Lingotto factory in Turin, Italy, one of the paradigmatic structures of the modern era. Built to the master-plan of engineer Giacomo Mattè Trucco, starting in 1916, it is a great hollow rectangle 500 metres long. High on its roof is an automobile test-track with parabolic banking. Having reluctantly abandoned it as a manufacturing base in 1982, Fiat has progressively brought new life into the great space. Now, with the recent opening of the Giovanni and Marella Agnelli Art Gallery in a 'pod' extruded from the roof, the rehabilitation is complete. Renzo Piano — who came to world prominence when he and Richard Rogers won the design competition for the Pompidou Centre in Paris — is the architectural mastermind, and it was at his instigation that Shingu was invited to provide a water sculpture to stand in front of one of the building's long facades.

The 11.2-metre central column of Shingu's *Locus of Rain* consists of a hollow tube from which a water spray spouts high into the air. Around this revolve a series of arms, trumpet-shaped vessels and counterweights. Each of the two units on either side of the axis revolve in vertical planes around three pivots, the first on their shared axle, the second at the point where the lateral arms intersect with the poles that support the 'trumpets', and the third in the necks of trumpets themselves.

The ensemble is driven by water that falls into the trumpets, affecting not only their own rotation, but those of the poles that support them and the primary arms. Each mouth drinks from the spray when it swings towards the vertical, and turns gracefully aside as it becomes replete. Sometimes it will swing out of the nourishing spray before it is full, pulled away by the accumulating weight of water in the other trumpets. At other times, it will spin gently to disgorge into the pool below. Sometimes, two trumpets spill their waters almost simultaneously. At others, one performs its climactic act alone before rising to drink again.

Watching the hypnotic effect of the planetary cycles and epicycles is like witnessing a ballet choreographed according to nature's own laws of complexity. Compared to that classic of chaotic motion, the coupled pendulum, the variables are multiple, combining the unpredictability of the water spout — both in itself and as affected by the breeze — with the interactive ensemble of the rotating components. The two rotational ensembles work according to the same principles, as we can intuitively sense, yet they never perfectly repeat the same phase, either in themselves or in concert.

The design is uncompromisingly abstract. Yet there is an elusive feeling of things remembered from nature — of fish rising to the surface to gulp air, of elegant water birds drinking at a waterfall, of flowers dipping their heads in the wind and rain. Through his artistic

insights and constructional skill, Shingu is involved in a quest to ensnare the patterns underlying the variousness of nature in motion. Many a scientist will share the motivation behind this quest.

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Susumu Shingu's *Locus of Rain*, located at Fiat's Lingotto factory in Turin, Italy.