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from: "On The Road To World-Wide Science" by
Michael Moravcsik and John Ziman (1986).

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PREFACE

To the subject of scientific development in the Third World, Professor Michael Moravcsik brings the precision of a scientist, and the zeal of a missionary convinced of the virtues of modern science and modernity. There can be no question as to the author's qualifications as a physicist, or of his active involvement in numerous attempts to stimulate scientific growth in developing countries. The set of essays comprising this book are the clear and concise expression of a mind capable of choosing between facts, discerning those which conceal something and recognizing that which is concealed. To be sure, not every argument or conclusion reached herein will be popular with all readers. But even when the reader disagrees completely, the issues raised are so important and clearly posed that they shall surely force his gratitude.

"Scientific development" has come to be virtually an article of faith, and paying homage to it is a familiar ritual in Third World countries. The incense, however, is frequently burned at the wrong altar because it is only certain particularized applications of science—not the absorption and internalization of its other myriad aspects—which are really meant. It is, of course, perfectly natural that developing societies should seek modern agricultural techniques, factories for producing cement and steel, and so on, and identify these as "science". But, the author reminds us, there is far more to science than this. Indeed, science has as much — if not more — to do with philosophy and a world outlook as with industrial and technical production. As a methodological procedure, it combines observation, experiment, classification, and measurement to test various laws, hypotheses, and theories. Built on a great stream of thinkers and workers lies the vast cumulative tradition of scientific knowledge. And, in its philosophical dimensions, science is perhaps the most powerful influence moulding man's beliefs and attitudes towards the universe. Science lives in the minds of men and women, not inside equipment and machines.

The point, therefore, is that scientific knowledge cannot be simply bartered for material goods and services. In one of his essays, co-authored with John Ziman, the author attacks the notion that the advanced countries should somehow export the great surpluses of their knowledge factories in exchange for cocoa, bananas, oil, and copper. Quite apart from enhancing the relations of dependence, he argues, this transfer simply cannot be effected as a commodity exchange. A substantial indigenous scientific infrastructure is vital for any meaningful communication to occur between developing and developed countries in this sphere. This may well be a truism, but it is one which gets here the forceful emphasis it deserves.

In identifying the principal hurdles faced by Third World science, Professor Moravcsik articulates what is often felt but seldom stated. The problems are far more complex than

one might infer from the remedies that are usually suggested. In considering the issue of increased spending for science in the Third World, this immediately becomes apparent. There is no question that Third World countries, as a whole, spend much too little on scientific development. Considering the material and intellectual needs of such countries, one could easily argue for, say, a tenfold increase in the amount. There are definitely countries which would benefit immensely from some such change, and one could confidently predict a speedy transformation of their entire techno-socio-economic structure. On the other hand, there are also examples where, if all other factors are left constant, this change would probably do little. This is to be expected wherever the principal bottlenecks involve a rigid and irrational bureaucracy, or vital decision making powers are concentrated in the hands of an unsympathetic and non-understanding leadership, or when corruption pervades the entire fabric of society. In such countries, various externalities have a tendency for soaking up arbitrary amounts of funds. The creation of new scientific institutions on mere administrative impulse affords one such example. Bearing pretentious titles such as "Centre of Excellence" in this or that field, a veritable population explosion of new institutes and organizations has occurred. Formally, one is obliged to count this as progress. But, in real terms, notable success never occurs unless the new institution is endowed with a crucial, valuable, and scarce resource — the leadership of competent, imaginative, and dedicated scientists belonging to the country itself.

Living in the post-colonial era, but one in which the unhappy division between the metropolis and the periphery persists, the political, economic, cultural, and sometimes military, domination by the West inspires a reaction against the perceived instruments of domination. Modern science, sadly enough, has become increasingly an object of attack as well. One consequence is that, from time to time, there appears the notion of a science different from "Western science". There is no question that technologies differ from place to place. But is there such a thing as "Third World science" or "Islamic science" or "Marxist science"? The author takes an explicit and unapologetic stand: his answer is a simple no. One cannot agree more. The idea of any special science in this sense negates the concept of science as a universal, independent, rational human endeavour which can transcend divisive national and ideological boundaries. Upon examination, one is struck by the fact that such constructs derive from passionately held beliefs of how matters ought to be, rather than what is required by the imperatives of logical and empirical enquiry. Neither the premises, or the conclusions, of any "special science" are the least bit in doubt. It seeks to reaffirm what is already known, not search into the unknown. No new mathematical principles are sought, no experiments will be designed for its verification, and no new machines will be built on account of it. Like creationism in the West, the numerous varieties of "special science" are a reaction against modern science, and not a new direction of science. Their pursuit is nought but a fruitless chase.

And now to move on to more delicate, controversial, and perhaps irresolvable matters. The need for such a discussion is forced by the value structure implied by science and modernity, and by the explicit positions taken on this in the book.

Science has evidently prospered in some Third World environments. In others it has not. Why? Access to financial and material resources certainly cannot be the whole story, even though these are universally emphasized and are undoubtedly essential. This question forces upon us the importance of considering the overall idea system of society, and how it influences the acquisition of positive, rational knowledge. Overall idea systems — by which shall be meant beliefs, attitudes, social mores, general assumptions, and specific religious and ideological positions — are of the profoundest importance in human history. Julian Huxley compared them to skeletons in biological evolution: they provide the framework for the life that animates and clothes them, and in large measure determine the way it shall be lived. Embodied within an idea system, to an extent which may be greater or lesser, is rationality — by which is meant that matrix of connections assigning cause to effect. Rational thought and science have their origin in man's drive to have power over events in the external world. Without this impelling Nietzschean obsession, humans become mere buoys that float on the waves. A society oriented towards fatalism, or one in which an interventionist Deity forms part of the matrix of causal connections, is bound to produce less individuals inclined to probe the unknown with the tools of science.

So let us accept, at least as a provisory hypothesis, that the idea system of a society has more to do with its scientific advancement than any other factor. Combine this with the fact that a great revolution took place in Europe some 400 years ago as a consequence of which experimentation, quantification, prediction, and control became the paradigm of a new culture. It was only after this that a mysterious and capricious universe could be understood as mechanical, orderly, and in which "number holds sway over the flux". Add to all this the continuing scientific and technological pre-eminence of the West. What emerges? That the Western idea system, based on a Greco-Roman legacy and Christian ethic, is superior to any of its contemporaries?

The author's position on the merits of European civilization is perfectly explicit. His essay, authored jointly with John Ziman, begins thus:

"With European industrial civilization comes European science. It is a package deal. The question whether a culture thus superseded or repressed had its own form of science has become purely academic: the process of economic growth and social development is entirely predicated on the "rational materialism" of post-Renaissance Europe and its North American colonies . . . In the present discussion, it is taken for granted that European science should become a dominant cultural force throughout the world."

Whether or not our reaction to this is typical of a person from a country with a colonial past, we cannot tell. But, in spite of having sworn allegiance to both the techniques and philosophy of scientific rationality, and though sadly aware of the shortcomings and defects present in our environment, we must nevertheless confess that such explicit Eurocentrism makes us deeply uncomfortable. Presuming that the book seeks to spread science rather than "civilization", such a position does harm to its mission by introducing an extraneous issue. The temptation for retort becomes irresistible: Do the contributions of the Chinese, Islamic and Hindu civilizations warrant such a peremptory dismissal? Were not Auschwitz and Hiroshima consequences of a supposedly rational and scientific European culture? How should we assess a civilization which has created the concept of "megadeaths" and "mutual assured destruction"?

Personally, we feel that such divisive issues should, and could, have been avoided. Instead of tracing the roots of science to narrow geographical or cultural domains, it would be infinitely more preferable, and also more accurate, to regard the development of modern science in a universal context — as a collective effort of mankind in which different civilizations have contributed their share. One can persuasively argue that science is the natural outcome of human intelligence. Rational man has emerged from the realms of biological evolution endowed with innate mental structures capable of abstract thought. Epistemological and linguistic research bring evidence that humans are intricate "pre-wired" computers needing only external stimuli to set cognitive and creative processes into operation. Regarded in this manner, science pretty much had to develop sooner or later in the course of man's progress. That it should have developed over the last few thousand years is probably quite accidental. There were countless ages before that during which there was no knowledge, and there may be countless ages without knowledge in the future. On a cosmic scale, the history of knowledge and science is profoundly irrelevant, reminding us of the futility of parochial pride in the historical cultures which we accidentally happen to be associated with.

Differences aside, one must acknowledge this book as a valuable manual on science development. It sets out the role of science in technology transfer with unusual clarity, identifies both the immediate and long term needs of science institutions, discusses the role of scientists as science managers, brings to attention the importance and feasibility of scientometric studies, emphasizes the need for communication among scientists, analyzes the problems and potentialities of overseas university education, and much more. One hopes that it will be widely read, and with care.

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