The Universal Goal

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The main topic of ICMI Symposium in Warsaw is:

What should be the goals and content of general mathematical education?

and basic questions are

What mathematics should be taught in primary and secondary schools in advanced countries and in developing countries?

What should be "mathematics for all" in a given society?

ICMI has had an excellent idea in proposing these subjects. It is important for development countries to have their problems also discussed in international forums. This is all the more so given the acute economic situation in many of these countries which makes work at a regional level extremely difficult. For instance, the "Sexta Conferencia Interamericana de Educación Matemática" of IACME (Inter-American Committee on Mathematical Education) to be held in Mexico had to be postponed due to grave economic crisis of my country. But it is not only because of economic difficulties that it is important to touch on these subjects in international milieu, not indeed. In the second part of my talk (not in these notes) I shall show, with a few selected examples, some of the big problems which arise when trying to fix goals, set up programs and in general to make decisions, if one wishes that these be useful not only for developed countries but also for developing nations.

But before that, I would like to present, and this will be the first part of the talk, a goal that I feel is of exceptional importance, and is often overlooked because it is too well known. This goal is as important to advanced as to developing countries. Even more, it is of exceptional value to each individual. It is a goal "for all". I call it "the universal goal".

I accept the following principle as my starting point:

Mathematics plays a role in the life of each individual that can and should be the same as that that mathematics has played in human history. And this is enormous.

Here are some statements made by my professor Alberto Barajas[1].

*Mathematics is the greatest creation of the human spirit.

*Nothing comparable to mathematics has ever existed.

*Mathematics constitutes mankind´s most priceless treasure.

*Humanity was one thing before mathematics and another after.

*Mathematics is the most human of all human activities.

*In the same way that the Bird flies and the Fish swims, Man created mathematics. It is characteristic of the human essence.

*The logic and abstract spirit are a unique feature of human being.

Possible due to this,

*Humanity has found in mathematics its strongest back up.

The next statements are important:

*Thanks to mathematics, man is able to be sure of something.

*There is something in the truth of which one can have full confidence.

I like this statement of Emile Borel very much:

*Mathematics is the only science where one always know exactly what we are talking about and where one is certain that what we are saying is true.

(Emile Borel wrote this in contrast to Bertrand Russell´s punch line who, to emphasize the basic role arbitrary definitions play in mathematics, stated that "Mathematics is the science where one is never sure what he is talking about nor if what he says is ever true".)

Consequently,

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[1]Alberto Barajas. Mexican mathematician. Gravitation and number theory. Professor of algebra and number theory and at the same time grand connoisseur and admirer of "geometric geometry". Optimist and bon vivant.

*Mathematics has produced for humanity an immensurable psychological well being. We are no longer afraid of insane gods playing merciless games with us human beings.

And as I observed in my point of departure, this psychological well being that according to Barajas humanity owes to mathematics is also enjoyed by each one of us. Even in small doses.

At different moments of our lives we have felt the exhilarating sensation that there exists something that is true. It really exists. Something we can believe with our eyes closed. Something about which we do not have the least doubt.

This is the universal goal:

Each individual must go deep enough into mathematics to be convinced that there exists something that is true, something beyond any doubt. This should be every man´s birthright.

At this moment you may say that there are other things outside mathematics of which men can be sure. For instance, you may say that we are sure the Sun will rise tomorrow. But has humanity really been sure of that? Not really! We all know that some civilizations have sacrificed a young maiden at sunset to please the gods and guarantee that the Sun will rise again next day.

Universal goal of general mathematical education shows his exceptional value when we have to admit that mathematics is the only field in which men can come to an agreement. In the arts, in philosophy, in economics and above all in politics, this is utterly impossible. Politics, economy and nationalism have produced the bloodiest orgies whilst mathematics is a unifying force.

If I say "7 is a prime", everybody will agree. If I say "this is a beautiful flower" somebody right away will say that I have a very bad taste and, more than that, someone else will show me that it is not even a flower. But π and e will remain transcendent.

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