communities. Now the problem is that mathematics, as a body of knowledge and a tool for action, cannot live long in such a splendid isolation. It has to be supported from outside, that is, it has to receive cultural support by being reinstated into culture. Society as a complex whole has needs, which include mathematical needs. Cultural unawareness of these needs is a blatant fact which endangers the very development of present-day societies. Let me add here that such a problem arises in every hamlet of the “Global Village” in so far as, willy nilly, the Western model of development is being extended to the whole planet.

(7) The mathematics awareness we should try to spread meets with a difficulty of which we will not easily rid ourselves. There is no evident relation between society’s mathematics needs and those of the individual. Mathematics needs can be felt at the level of society as a complex machinery. But, as a consequence of the division of labour, they usually remain foreign to the individual. This is why the man in the street can so easily ignore mathematics.

(8) However, the process of separation between the needs of society and those of the individual can never be totally complete. More and more people, as individuals, and especially as professionals, are personally affected by the growing presence of mathematics around us. Many are very likely to be confronted with personal mathematical needs at different levels of sophistication. Now a new problem arises. Cultural ignorance of mathematics impedes the mere recognition of these mathematical needs. Thus, we are taken back to the central question of our round table: how can we help to increase cultural awareness of mathematics as a social reality — not only for the few, but indeed for the many?

Institutional Dimension in the Definition of Cultural Strategies in Mathematics

by André Rouchier

A round table is a place where it is possible to intervene on two levels, opinion on the one hand and technique on the other. It is sometimes necessary to go beyond the greater or lesser competence of the expert to produce the elements needed for a debate in which each intervention represents a term. I am expressing myself in French because that is the language in which I can best express those notions to which I make reference.

(1) Mathematics is extraordinarily present in numerous aspects of society, in technical and industrial activities, for example. It is, in combination with physics, chemistry and computer sciences, embedded in a large number of objects in daily
Institutional Dimension in the Definition of Cultural Strategies

life, both in their material as well as functional aspects. Sometimes it is so em­
bedded that we do not know how to identify it without a specific search. As for
extracting it, most of the time that could only be done by destroying the object
or by concealing the technique. We agree with Yves Chevallard in saying that
mathematics has great social relevance, closely linked to a no less greater social
legitimacy.

(2) We must admit, however, that mathematics does not enjoy the cultural acknowl­
edgment which is its due, given its importance. Again following Yves Chevallard,
we can characterize this situation by saying that mathematics does not enjoy cul­
tural relevance. Everybody knows this whole set of attitudes that consists of
distancing oneself from any positive demonstration regarding mathematics. To
say the least, a lot of people have ambivalent attitudes and it is infrequent to find
someone who claims to have mathematical ability, apart from the professionals.
What manifests itself through negative reactions and the frame of mind they re­
veal could be studied on several levels. The sociological level could consist of
studying the relationships between what is said and the reality of social positions,
notably through the cultural signs that serve as beacons. The psychological level,
which is more interior, could consist of describing the patterns of these reactions
in relation to the structure of causal elements. This is not our subject here, and we
will consider the lack of cultural relevance as a recognized fact.

(3) Outside of professional areas where the presence of mathematics is evident,
either directly through the use that is made of it, or indirectly because material or
symbolic tools loaded with mathematics are involved, the encounters of a given
individual with mathematics almost exclusively occur at school. To go beyond this
educational framework, to show mathematics under another angle and to commu­
nicate through carefully organized practical procedures are the basic ingredients
of what is classically called popularization. Traces of it can be already found in
the Middle Ages. It is an ongoing attempt to fit mathematics into the cultural
mould of “civilian” society, to lay the foundations for mathematical taste which
could also be a taste for mathematics. That mathematics should be made to look
commonplace could be seen in various seemingly ordinary situations. “How do
we call the number that, multiplied by itself, gives a given number?” “What is
the theorem that says that, in a right-angled triangle, the square of the hypotenuse
equals the sum of the squares of the other sides?” Here are, for example, two
questions asked in the mathematics question set of a French televised game show.
That mathematics should be present on this level of social life is still quite un­
common, and the answers do not always require a cultural background that goes
beyond vague memories. There is undoubtably a definite reach toward certain
categories of people, notably school students, in order to achieve a different rela­
tionship with mathematics. These initiatives will be discussed in another round
table of the European Congress of Mathematics. The Horizons mathématiques
Round Table D: Let's Cultivate Mathematics!

exhibit is on display during the Congress. The Rallyes mathématiques or Maths en jeans initiatives are also in the process of receiving some recognition among the community of mathematicians. However, do these initiatives have both the form and the contents which could convince us that mathematics has been made more ordinary through them?

(4) If we push our questioning further, we may also reflect, based on the assumed lack of cultural relevance, on the objects on which and from which the aforementioned fashionable disdain appear. At the same time, we may also reflect on those mathematical objects and concepts that are not a customary part of an “ordinary” mathematical culture. Common terminology, on the contrary, has a tendency to forget what has been learned in school, or is not able to incorporate what mathematics has to say. It is thus that a fraction always stays a fraction and never appears as a rational number, a designation confined within the mathematical world and that shows as well the foundations of a rational number. Even more so, all that has to do with probability theory and statistics never emerged in or contributed to the constitution of a culture.

(5) It is not our intention to brand as simplistic the argument according to which the specificity of mathematics is the main reason for its lack of cultural expansion. Mathematics demands that a specialised vocabulary based on abstract and complex concepts be manipulated in written form. Mathematics very rarely presents the statements it produces in the light of the phenomenal realm of ordinary life. Mathematics does not deal with the physical world in the same fashion as physics, chemistry and the natural sciences, which have the possibility of placing themselves from the start in the immediate vicinity of the manifestations of the real world, the one that imposes itself massively on us through our senses. Which order of reality, familiar enough so as to appear to be concrete, could be dealt with and within a culture that is connected with mathematics? To speak in mathematical terms of a fact of everyday life seems to require involving complex symbolic systems from which the usual language and recourse to imagery and metaphor seem to be excluded. All this would soon sound excessive and pedantic. In mathematics, writing seems to be indispensable, because the definitely more familiar registers of oral and gestural expression are no longer sufficient. To make the underlying idea of the motto Let's cultivate mathematics! alive and instrumental, it appears important to take into account the specific difficulties related to the original or non original semiotic elements that will have to be introduced. This is an unwritten law that is well-known to all popularizers.

(6) There is another factor that contributes to the fact that such “limited strike” initiatives as an exhibit or a “rally” competition, do not receive all due credit as carriers of a mathematical culture. These activities lack temporal dimension and are not inscribed into a duration that could accommodate itself to the laws of