

At the same time, the use of mathematics as a device for selecting future administrators—and the fact that the entrance requirements for the leading *grandes écoles* have come to dominate much of the school curriculum—is seen by many as having contributed to an excessive formalism in the teaching of mathematics.

For some students, this deprives the subject of much of its imaginative creativity, while for others it creates a separation between the contents of mathematics courses and the problems they encounter in the real world.

“Our problem is that the only choice students have in the *lycées* [high schools] is to take a very high level of abstract mathematics or nothing at all,” says former research minister Pierre Aigrain, now senior technical adviser to the electronics company, Thomson. Aigrain was referring to a problem that even the Collège de France has described as “one of the most flagrant faults” of the French educational system. “We need to adapt the level of mathematics to each student’s taste.”

Ironically, these problems were only compounded by the introduction of “new mathematics” into school courses in the late 1960s and early 1970s. The increased emphasis on abstract concepts divorced from concrete reality, which was introduced in order to make mathematics more of an intellectual challenge, may have succeeded for the few; but for many pupils, it only made the subject more alienating, and much time has recently been spent on rethinking the reforms.

For some mathematics teachers, the alienation from their subject among the majority of school pupils, particularly among those who would otherwise like to specialize in scientific subjects, has now gone so far that radical action is required. “To save our scientific education, we should lower and modify the requirements in mathematics in secondary schools,” says Jean-Yves Mérimod, assistant professor at the University of Angers.

Yet the traditions are firmly entrenched. When former Education Minister Jean-Pierre Chevènement, for example, tried 3 years ago to introduce wide-ranging reforms into the school system that would have involved significantly reducing the amount of mathematics taken by most pupils—and hence the hegemony which the subject continues to exercise—he was met by protests from some mathematics teachers.

They claimed that he was proposing to reduce their workload primarily as a way to avoid increasing their salaries. “Reducing the number of hours of mathematics classes in the *lycées* stands a good chance of aggra-

vating the problems of teaching the subject, without any guarantee that there would be an improvement elsewhere” says Méla.

Some leading French mathematicians have refused to join campaigns for popularizing their subject. One professor at the prestigious Collège de France, asked why he did not do more teaching, is said to have claimed that mathematics students fell into two categories: those who were bright

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enough not to need his help, and the rest, whose help he did not need.

Others, however, argue that this élitism has become counterproductive. Failure to acknowledge the need to guarantee a future generation of both university and school mathematics teachers, it is argued, could have severe economic implications by reducing the supply of the mathematically trained engineers and technicians required by the high-technology companies of the future.

Breast Cancer Study Vetoed

A key advisory group of the National Cancer Institute last week vetoed a controversial proposal to study the possible link between breast cancer and fat consumption. The action effectively killed the \$130-million project, which would have been the most costly experiment ever conducted by the cancer institute (*Science*, 1 January, p. 17).

For the past several months, various cancer institute advisory groups have debated intensely the scientific merits of the plan and whether the institute should fund the project. But at a meeting on 7 January, arguments were put to rest when 11 of 13 members of the institute’s board of scientific counselors voted against proceeding with the study. Two members abstained.

The disapproval was based largely on heavy criticism of the proposal by a panel of experts, who evaluated the plan at the board’s request. “The hypothesis that dietary fat is a cause of breast cancer among women is plausible, but only weakly supported at present. . . . The [study] as cur-

Already, some school districts are having to meet a shortage of mathematics teachers by importing teachers from French-speaking parts of North Africa.

At the intellectual level, some claim that, just as the mass emigration of German mathematicians in the 1930s destroyed that country’s supremacy in the field, the new brain drain to the United States could eventually devastate what is still known as the “French school of mathematics.”

“For very different reasons, the same phenomenon is lying in wait for us, if nothing is done to remedy the situation,” says Barsky of the CNRS. A recent survey of mathematicians who had emigrated to the United States found that most quoted a combination of better pay and better working conditions as their main reasons for leaving. But the result, says Barsky, is that “France is subsidizing the United States, in that we are paying for the training of American mathematicians.”

The remedies being suggested have a familiar ring: more teaching posts in universities, more long-term planning for research programs, better pay for school mathematics teachers, and so on. Aware of the significant impact of the NAS report in Washington, the two societies that held the recent meeting are planning to produce a “white paper” for the government, listing their grievances and describing the “disaster” that could arise if no action is taken. ■ DAVID DICKSON

rently proposed should not go forward,” the seven experts said in a unanimous report submitted to the board shortly before the meeting. The expert panel also expressed serious doubts that a proper control group could be maintained over the duration of the lengthy study.

According to the proposal, 10,000 women across the nation would follow a low-fat diet for 10 years to test whether it would reduce their risk of breast cancer. An additional 22,000 women would serve as controls.

An important question left unresolved by the committee was what criteria or evidence would be sufficient to ever undertake a randomized clinical trial to test a possible relationship between diet and any type of cancer. David Byar, head of the cancer institute’s biometry branch, who supported the breast cancer study, said at the meeting, “How will we begin any trial unless it’s a foregone conclusion what the results will be?” The committee did not address his question. ■ MARJORIE SUN