huge exports of armaments, is surely not a "third world country," as Hao claims, but one of the most formidable powers in the present unstable world, especially since it is no longer kept in check by the erstwhile USSR. Hao also forgets that "Soviet scientist–dissidents" began to call "for boycotts by Western scientists" only after the tottering stage of the abominable Communist regime began; they could not risk such a step while the regime was strong. Thus the fact that in contrast to the former Soviet protesters, "most scientists in China welcome the . . . opportunities to interact with their foreign counterparts at conferences" (and do not seem to protest) is probably more a sign of the regime's oppressiveness than of the scientists' satisfaction with the system.

Hao attempts to alleviate Western scientists' concerns about helping the Communist system by transferring information to individual contacts. Revealingly, she says that "Western scientists go to conferences as individuals, and they can help individual Chinese scientists by providing them with current information." Anyone who knows totalitarian systems from the inside (I have survived two) knows that such regimes have no respect for "individually acquired" information or indeed for anything individual. Hao must know it too.

Finally, I find it offensive that Hao condescendingly dismisses the protests of the few Chinese scientists (such as Fang Li Zhi) who were lucky enough to escape from the clutches of the present rulers of their unfortunate great country and who have taken the trouble to raise their voices in the wilderness.

PAUL ROMAN
2/93 *Ludenhausen, Germany*

HAO REPLIES: Paul Roman misread my letter and bases his criticism on a few phrases taken out of context. My letter addressed whether Western scientists should boycott conferences in China as a way of protesting human rights abuses. The meeting that prompted my letter was a conference on semiconductor physics sponsored by the International Union of Pure and Applied Physics. So I was writing about conferences on basic research, and the issue was human rights, not "helping the Communist system" by providing it with information on sensitive technology.

Western scientists show real concern for their colleagues in China if they are willing to interact with the majority of Chinese scientists face to face, to hear their voices and to learn about China's situation firsthand. Nothing is preventing such Western scientists from protesting human rights conditions in China; indeed, their protests, made in China at a conference in the presence of the Chinese, are more effective than moral arguments among themselves in their home countries.

Roman seems rather ignorant of the history and situation of Chinese scientists. The Chinese government has never supported basic research adequately. At its worst—during the Cultural Revolution—the government tried to eliminate basic research (along with all higher education) altogether; it sent scientists and other intellectuals to be "re-educated" as peasants. Now, with the introduction of a market economy, basic research, which does not produce immediate profits, has sunk once again to the bottom of the government's list of priorities. Some Chinese scientists, in spite of adverse conditions and in spite of the government, have managed to continue with basic research. This in itself is defiance.

As for those who have left China to protest from abroad, I mean only to say that their voices are not enough. Obviously, not all Chinese scientists are able to leave the country, or even wish to, but they deserve to be heard nonetheless, for scientific as well as humane reasons.

XIN HAO
9/93 *Beijing, China*

Jesuits' Role in Revolutionary Science

In general I enjoyed the excellent article "Creativity and Big Science," by John L. Heilbron (November 1992, page 42), but I humbly disagree wholeheartedly with some of his views about the Society of Jesus. Eminent historians of science do not share Heilbron's viewpoints on the Jesuits, either.

Heilbron states that "the theoretical basis of their curriculum was old-fashioned even then," that is, in the 17th and most of the 18th century. Francis Bacon felt differently, since he wrote that their educational methods "are so good that I wish they were on our side."[1] And the Jesuit Christoffer Clavius, who was second only to Galileo during his lifetime, is considered by George Sarton as "the teacher who carried the most influence during the Renaissance."[2] Heilbron is certainly right in stating that "a complete inventory of Jesuit-trained savants would include most of the members of the Paris Academy of Sciences during the 17th and 18th centuries."

Heilbron also writes, "The Jesuit savants did exactly what their superiors told them to do, and their publications redounded to the glory of the society, not to the advancement of the individual." I do not think that statement is very accurate, since the fundamental motto of the Jesuits is *Ad Majorem Dei Gloriam* ("To the Greater Glory of God"). And it is not true that "the Jesuit savants did exactly what their superiors told them to do," except in the matter of certain religious principles. The great Jesuit scientist of the 18th century Ruggerio Boscovich, the most eminent defender of Newtonian mechanics on the Continent, was a clear example of an independent scientist.[3]

From a religious viewpoint the Jesuits have always been a clear example of a "new frontier" not always understood by some members of the Church hierarchy or by great lay scientists and thinkers such as Pascal.

References

1. F. Bacon, *Advancement of Learning*, Everyman, London (1954).
2. G. Sarton, *Six Wings: Men of Science in the Renaissance*, Indiana U. P., Bloomington (1957).
3. P. A. A. Laura, Int. J. Mech. Sci. **33**, 593 (1991). W. Johnson, Int. J. Mech. Sci. **33**, 579 (1991).

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3/93 *Bahia Blanca, Argentina*

HEILBRON REPLIES: Patricio A. A. Laura calls attention to a few rhetorical flourishes that I freely concede are exaggerations. My purpose was not to give a nuanced account of the contributions of the Jesuits to the Scientific Revolution. I tried to do that in my *Electricity in the 17th and 18th Centuries* (University of California Press, Berkeley, 1978) and *Elements of Early Modern Science* (the same, 1982), in which I claim that "the single most important contributor to the support of the study of experimental physics in the seventeenth century was the Catholic Church, and within it, the Society of Jesus."

JOHN L. HEILBRON
9/93 *University of California, Berkeley*

Correction

September, page 78—In addition to the positions mentioned in the news story on the Franklin Institute medalists, Serge Haroche has been a part-time professor at Yale University and is currently a member of the Institut Universitaire de France. ■