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For the scientists on the spot the situation in their country is close to their skin, and many feel that it is a bit too easy to voice protests from a distance whilst enjoying the benefits of a liberal society.

In sum, I think that the action of those who call for boycotts of bona fide scientific meetings, or aim at isolation of a scientific or cultural community and their institutions, is misdirected; it hits the wrong people and does little else.

As to the Johannesburg conference, I am satisfied it was not just a pleasant meeting (as most participants will confirm), but a successful venture; there were no political overtones and it was open to all—including (and I resent having to mention what I regard as a matter of course) black colleagues from within the country and abroad. It should augur well for the future of scientific life in South Africa as part of a world-wide organism, *if* the international science community continue to lend it their support and encouragement.

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Helicopter-blade design

In the article "Thirty years of fluid dynamics" (Sept, page 38) the transient lift of a helicopter rotor blade is presented as an example of how airfoil behavior "cannot" be systematically predicted. Such predictions are of critical interest to the helicopter engineer, since the limiting thrust performance of the rotor can be affected by more than 10%.

As von Karman is supposed to have said "only God understands turbulence," and all prediction methods for turbulent flows necessarily involve empiricism. However, in the case of airfoil transient response, it is possible to understand the basic physical principles with a reasonable degree of clarity, and work has been in progress on this problem for some years. Recently T. S. Beddoes[1] has succeeded in establishing a systematic prediction method for this problem.

An example of the agreement between theory and experiments for a helicopter-blade airfoil is shown in the figure. We are now using this theory at Westland Helicopters to suggest airfoils that will have optimum transient response rather than the usual requirement for high steady lift capability.

Reference

1. T. S. Beddoes, "Onset of leading edge separation effects under dynamic conditions and low Mach number" in American Helicopter Society Annual Forum 1978, No 63.

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