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lished a series of articles which made public for the first time the scientific origins of the H-bomb in the 1859 paper by Bernhard Riemann on shock waves, and the development of those ideas by leading German hydrodynamicists and aerodynamicists during the 20th century.

Rather than prosecute the FEF, the government took injunctive action against the *Progressive* to prevent publication of much more general material already available in the public domain. If the government won its case, the precedent would be set for legal action against the FEF on issues secondary to those raised by the foundation's reports.

The FEF entered an *amicus curiae* brief in the *Progressive* case based on the stated intention of the Atomic Energy Act of 1954 to promote the proliferation of peaceful uses of nuclear energy and of scientific knowledge. This legal intervention was followed by the publication in several newspapers of letters written by one Charles Hansen on H-bomb "secrets." Immediately, the government withdrew its case against the *Progressive* and author Howard Morland. It nevertheless restated its intention to continue to vigorously use its classification and punitive action prerogatives.

In the past week, sources within the American Civil Liberties Union (which defended the *Progressive*) have reported that the government is bitterly divided between those in the DOE who want to stop the spread of fusion "secrets" and those in the Justice Department who consider this a risky proposition. At stake is whether the proliferation and classification issues will continue to be used to kill advanced nuclear development, or whether the way will be cleared for the fundamental scientific research necessary to achieve economical fusion in this century.

—Charles B. Stevens and
Dr. Morris Levitt,
Fusion Energy Foundation

Rudakov: 'Fusion research at a turning point'

Dr. Leonid Rudakov's dedication address at Moscow's I.V. Kurchatov Laboratory was covered by the Oct. 6 issue of the Soviet daily Pravda. *The following are excerpts from that article.*

Today, our area of science (fusion research) finds itself at a turning point; we are building prototype thermonuclear plants. One of these is the Angara-5. When it is completed...we hope to achieve a driven thermonuclear reaction that will produce more energy than the plant requires to operate. Angara-5 should prove that it is possible to build a commercial demonstration reactor.

Why is the experiment called "Angara"?

There are several explanations, but I like this one: Many rivers flow into Lake Baikal, but only one, the Angara, flows out. It's the same in our area of science; there are a number of different approaches under investigation, but we hope that ours will be the most effective.

We are working to create and control low power thermonuclear explosions. For example, in an automobile engine there are about 100 million microexplosions before the cylinder—the combustion chamber—is destroyed. For a thermonuclear plant to be economically profitable and to last a long time, it must do about the same. There already are chambers that can withstand rather powerful explosions.

The compression (of the fuel) must be a thousandfold above normal. Under that condition, the fuel can burn up before it flies apart.... The surface layer of the target must fly to the center with a velocity two orders of magnitude greater than that of a Kosmos rocket...The comparisons with Kosmos goes farther, in that we think of the surface layer as if it were a multitude of rockets aimed at the center of the target. It is necessary to guarantee that the rocket motors begin to work simultaneously, which means that energy is concentrated in a small volume in a short time. The target dimensions are about a centimeter. We store energy in capacitors, then we increase the pulse power to a huge value and direct it onto the target. It is enough to say that the energy thrown at the target in the Angara-5 module exceeds the power of all the electrical generating plants in our country (Don't forget that this is all happening in tenths of a millisecond!). The surface layer flares, its temperature reaches millions of degrees, and, like a multitude of rockets, it speeds to the center of the target. A very low power thermonuclear explosion follows that is nevertheless fully able to produce more energy than is expended in the reaction.

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