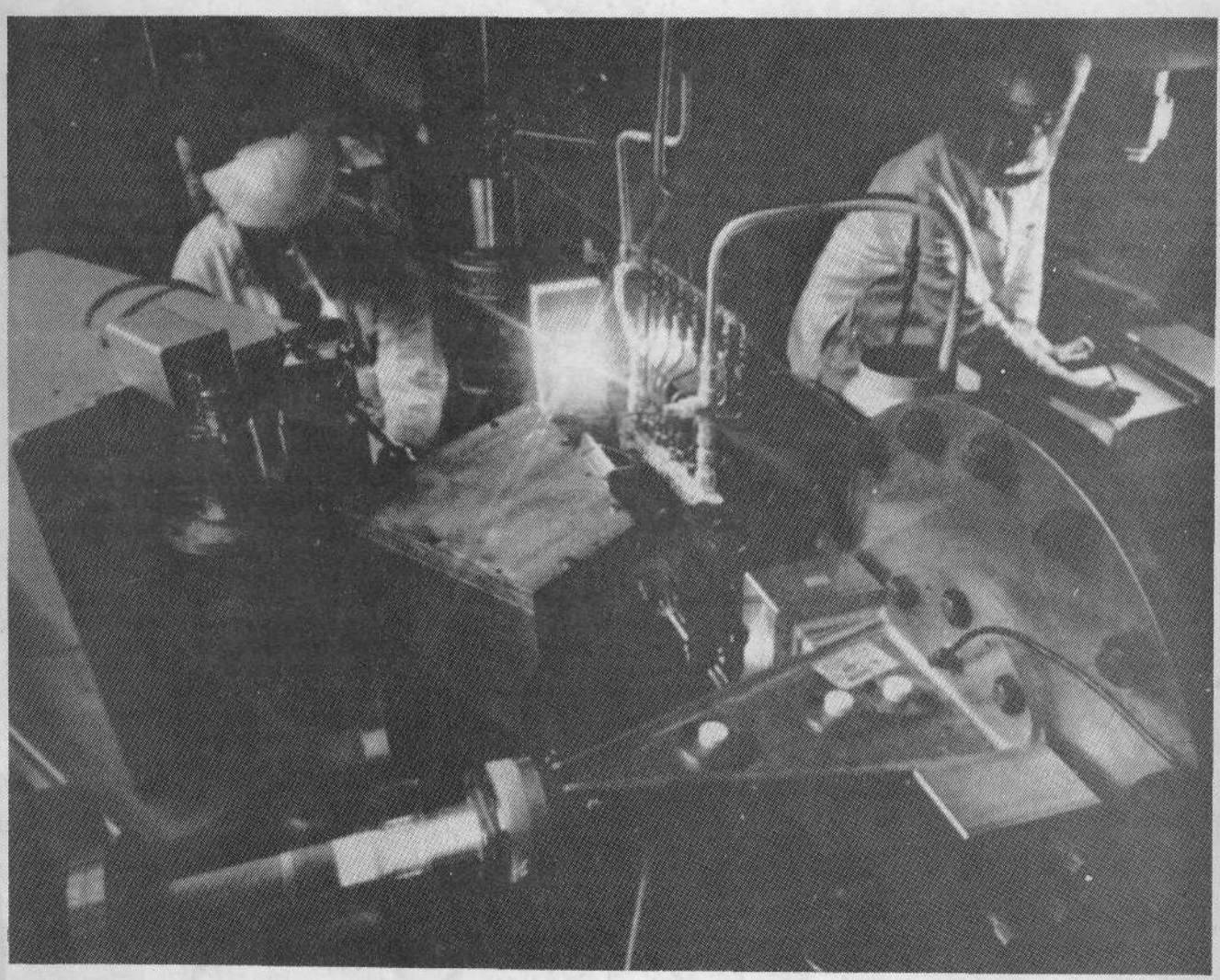
Fusion Energy Foundation



Newsletter

December, 1975
Vol. 1, No.4

$1.00

TABLE OF CONTENTS

Cover: An experimental carbon monoxide laser produced in the U.S. Soviet scientists are pioneering in the research and development of high energy electron beam excited excimer, chemicals, and gas dynamic lasers. These unique devices have immediate application both to controlled thermonuclear fusion power generation and the most advanced weapon systems.

EDITORIAL

From Protest to Program

Dec. 9, 1975

Our last editorial concluded by calling on American scientists to begin to pull their weight in demanding a fully internationalized crash fusion research program aimed at breaking every existing roadblock to the achievement of net energy reactions. Not only has the fusion community responded to this call, but the political forces supporting an international crash effort have since that time considerably expanded as well.

The most noteworthy event of the recent period was the presentation of a proposal by Prime Minister Miki of Japan to the mid-November Rambouillet, France summit meeting of advanced industrial nations. The Prime Minister's proposal called for a vast international development effort and international cooperation in fusion research. Miki additionally announced the formation of the Japanese Fusion Council to oversee the upgrading of Japanese fusion research and to coordinate its integration into an international program. Although it was front page news in Japan, the Miki statement was blacked out of the U.S. press.

The ferment underlying this development broke through, however, in the November issue of **Physics Today** devoted to Soviet science. In that issue striking corroboration of the FEF assessment of the relative conceptual and material superiority of the Soviet fusion program was presented by leading U.S. and Soviet fusion scientists. This indicates that the fight is on for an appropriately broad-based and adequately funded U.S. program.

Make no mistake about it, that objective will not be obtained without a relentless fight — against the Project Independence wreckers of the economy, the zero growth enemies of science, and the energy bureaucrats who are willing to do their bidding.

The most important weapons in this fight are ideas. In such a fight of ideas, led by those professionals who possess the courage and vision to fully understand its necessity, a relapse into the "tending one's own garden" mentality is unconscionable. As we have repeatedly emphasized, the FEF exists not because fusion is a nice idea and it's not nice to sabotage it. If we do not create a fusion-based economy by the mid-1980s you can say good-bye to your personal concerns, and with them, the future of the human species as we know it.

The immediate task is to determine where we stand and to specify what we need to get the job done. Any compromise of scientific standards at this juncture will not only assuredly lead us to fail, but will abrogate the very spirit and content of human scientific progress. As we all know, the Energy Research and Development Administration needs no help in that line.

This Issue:

In this issue we present documentation of the efficacy of the ideas that have catalyzed recent events. Critical in the spread of these ideas was the Oct. 11 FEF seminar on "The Structure of Research and Conceptual Approaches to Fusion." Two related results of that meeting are crucial. First, FEF determined beyond a doubt that ERDA's CTR policy has entered an irreversable self-destruct phase. In that context, FEF pushed to more rigorously delineate where fusion research stands relative to the problem to be solved, and to more rigorously specify the needed positive program to solve outstanding critical problems.

Published in this issue is an edited version of one of the review presentations given at the Oct. 11 meeting. We feel that it will serve well both as a brief to be elaborated and improved by scientists in the field and as an example of an effective presentation of the state of CTR research for the broader layers of the population. The second major presentation of Oct. 11, which focused on the relationship between the most advanced epistemological questions in physics and the scientific problems of achieving needed breakthroughs in plasma physics, will be published separately in the forthcoming FEF-sponsored International Journal of Fusion Energy.

On the question of ERDA's policy and the domestic and international motion for an alternative, we provide a condensed chronology of events following October 11. This is also generally material not appearing in the U.S. mass media.

Finally, we present a debate on Soviet and U.S. science and society prompted by our last issue. We hope this type of exchange becomes a permanent feature of the Newsletter.

What Now?

Now that the fusion community has begun to express its support for the priority of scientific investigations, it must inform that activity with the appropriate sense of urgency about ultimately developing efficient reactors. While there can be no ERDA-style shortcuts, neither can there be merely enlightened complacency.

What then should be done? It is time to eschew false modesty or opportunism and to prescribe in rigorous, concrete terms to Congress, the media and the population at large what is required to conduct a competent, inclusive research and development program. The result would be a fitting subject for our next issue.

As reported in this issue, there has already been significant motion in Congress and the media around fusion. Pro-fusion Congressmen and journalists, however, are still a minority. Part of the reason was posed by the chief counsel to a Senate sub-committee: "There are plenty of prominent public spokesmen for and against fission.Why aren't the fusior scientists speaking out. We need prominent public spokesmen for fusion to get things moving."

The development of such activity in the fusion community is indispensable if the priority of fusion research is to be put high on the Congressional agenda. The most important step in that direction so far has been the submittal by the U.S. Labor Party to Congress of the Fusion Technology Act of 1975, calling for a new fusion research agency with multi-billion dollar funding for basic research, technological development, and training.

We must be in a position when Congress reconvenes in January to have — at a minimum — several "energized" Senators and Congressmen armed with a program that is backed up by the fusion community and articulated by its leading representatives. An adequate fusion program can only result from such "open diplomacy" and the snowballing of public support behind a legislative campaign.

Then Congressional admiration-at-a-distance for fusion can be turned into a commitment to act.

LETTERS

November 6, 1975

Dear Dr. Levitt:

I wish to correct a statement made in the FEF September 1975 Newsletter on page 20: At the mid-July conference at Argonne National Laboratory the plasma focus paper, A Repetitively Pulsed Material Testing Facility, was presented by the LLL plasma focus group (not the Stevens group). Also since my name was mentioned a few times in this newsletter I would like to go on record as completely disassociating myself with such references as "...Teller and Rockefeller's other saboteurs of the U.S. fusion effort,..." (p.4) "...Teller, whose assignment has been (together with Rockefeller's Dr. Hans Bethe) to castrate plasma physics research..." (p. 9); "...embarrassment of the criminals sitting on the U.S. superior technological capabilities..." (p.4).

The newsletter had some very interesting items to report; it is unfortunate that the intemperate and incorrigibly crimson rhetoric of New Solidarity has spilled over into the pages of the FEF newsletter.

I wish to make it perfectly clear to the readers of the Newsletter that I am not a communist but that I am willing to listen to what the communists are saying, as indeed I listen to the words of Ralph Nader, the Environmental Defense Fund, Common Cause, Alexander Solzhenitsyn, Andrei Sakharov and others who have an earnest message. I came to the conclusion some time ago, without the help of New Solidarity, that the U.S. CTR program was far too narrowly conceived, that the ingrown entrenched nature of the CTR personnel of the national laboratories, the FPCC and the CTR office inhibits the growth of new ideas and the training and encouragement of young talented scientists. The hearings of the Joint Congressional Committee on Atomic Energy on the PPPL $215 million tokamak (TCT) display a cozy, fraternity-like, almost unctuous atmosphere that is revolting to me. But I am not so simplistic or vindictive to blame these defects in the operation of our democracy on Nelson Rockefeller or Edward Teller.

I recognize and deplore that the U.S. relative to the USSR, is neglecting basic research and the training of competent scientists capable of pursuing basic research. I am aware of the unholy interconnections between our government bureaucracies and corporate capitalism (witness the USDA and the grain merchants, fertilizer industry, insecticide industry; witness the USFDA and the pharmaceutical industry and the food processing industry). The same type of connection is very likely occurring in some measure between ERDA and the National Laboratories (including PPPL) and EPRI. "Oh cursed spite that we were born to set it right!" I witness examples of elected and appointed public officials arranging and funding research projects for the regional votes they can swing rather than the scientific results that will be obtained. And although we have the fine tradition of the Bulletin of Atomic Scientists and the FAS, today there are very few professors or scientific workers who are willing to jeopardize their jobs or their research projects by a vigorous protest against incompetence, greed, and favoritism involved in the funding of research by the Government.

Our last three Presidents have proven to be worse than "political animals." Their performance has been and is a disgrace. But in spite of these disgraceful performances in the U.S., I should like to point out that the USSR in almost 60 years has not held one free election and their people enjoy no Bill of Rights And in a land of somewhat mangy USSR bureaucratic carnivores (including scientific bureaucrats) the true unicorns have been not I.V. Kurchatov and L. Artsimovitch but Alexander Solzhenitsyn and Andrei Sakharov (and the other courageous people they defend). I will listen to criticism by the communists (the U.S. Labor Party and the NCLC) in the same way that an organic gardener observes the onslaught of insects: he uses the insects to tune up his gardening practices and he almost affectionately welcomes the presence of some of the insects. He does not use poison sprays to exterminate them. He does not embrace their program. (I have some friends who are communists and I imply no invidious comparison with this analogy.) There is no doubt that our U.S. democracy needs a great deal of tuning up, but the USSR needs a thorough purging.

I am not willing to entrust our Bill of Rights to the U.S. Labor Party from whose mouths falls the same type of rhetoric that we have for years heard from the USSR. In this sentiment I am joined by the overwhelming majority of scientific workers in the U.S. If FEF is to gain the confidence of this audience and wider U.S. audiences it must refrain from the use of the flamboyant polemics that marred the September Newsletter, and stick strictly to the business of objective explanation and objective criticism.

In retrospect I can now say that I was well-advised to withdraw from the Board of Scientific Advisors of the FEF. I now have the distinct feeling that my name has been and is being "used" for the partisan purposes of the NCLC and the U.S. Labor Party. I have already consented to be a member of the editorial board of the new International Journal of Fusion Energy, but I now intend to review that consent constantly and to be on guard against further partisan polemics such as occurred in the FEF Sept. Newsletter.

I expect this letter to be printed in its entirety in the next FEF Newsletter.

Sincerely yours,
Winston H. Bostick
Professor of Physics
Stevens Institute of Technology
Castle Point Station
Hoboken, New Jersey

RESPONSE FROM THE EDITOR

Dec. 9, 1975

In answer to Dr. Bostick's comments on the neglect of U.S. programs in basic fusion research and the training of competent scientists to take up fundamental problems in the field, we refer him and the reader back to the September FEF newsletter feature entitled Soviet Science Running Ahead by Lyndon H. LaRouche, Jr., the U.S. Labor Party's 1976 presidential candidate. This piece directly addresses the relevant issues of scientific development as a whole and development in the field of CTR research to which Dr. Bostick has addressed his concern.

Since Dr. Bostick has chosen to raise the wide political context of these issues, both in the case of the Soviet Union and the U.S., we direct his attention to the special features on J. Robert Oppenheimer and Alexander Sakharov contained in this issue of the newsletter. These two features directly address the questions of progress and repression of science, which Dr. Bostick has also raised.

Fusion Development at the Crossroads

by Charles B. Stevens and Eric Lerner

The worldwide effort to achieve controlled thermonuclear power—and to harness the unlimited, safe fusion energy which would then by made available—is at a critical juncture. Recent experimental successes and theoretical advances make it possible to state confidently that, **given sufficient funding,** several different approaches to controlled thermonuclear reactions (CTR) could achieve net production of energy — more energy produced than is put into a machine in 1976 and many more by 1980.

It is unnecessary at this point to re-emphasize the immense political and economic consequences dependent on the achievement of fusion power in the next decade, including the quick exploitation of existing fossil fuel reserves for full production with no fear that their exhaustion will leave humanity without large-scale energy resources. It is essential to understand where the fusion effort stands now, and what can be done to guarantee its success.

The demonstration of the feasibility of several different approaches to CTR would lay the basis for a broad-based scientific and technological effort to produce a working prototype of an industrial fusion reactor by the early 1980s and substantial amounts of fusion power by the mid-1980s.

But if the present outright sabotage of the fusion program in the advanced capitalist countries is allowed to continue, these breakthroughs will not occur—the experiments will not take place and the necessary further scientific knowledge will not be gained.

The basic issue immediately facing the advanced capitalist countries is whether to reorient their fusion programs toward a broad-based approach—investigating fully every avenue that seems at all worthwhile and emphasizing basic scientific research and fundamental problems common to all approaches—or to narrow the program, as the U.S. Energy Research and Development Agency (ERDA) proposes, to a single line advanced by mere technological improvement. A survey of the current status of fusion research will demonstrate that the first alternative, that advocated by the U.S. Labor Party, will almost certainly succeed, while the second ensures disastrous failure.

The Breakthrough in Fusion

Until the past year or so, fusion researchers have been mainly engaged in developing the technology necessary to try out the basic approaches to controlling fusion reactions originally proposed by a handful of theoretical physicists and astrophysicists in the 1950s and early 1960s. Now we are about to cross into a new realm of research where the technology is sufficiently advanced to allow actual experimentation with fusion plasmas and to study the real scientific questions which must be resolved in order to achieve practicable amounts of fusion energy. This new realm of advance will both allow and necessitate the development of new theoretical conceptions of how fusion-producing plasmas behave.

The basic means to achieve controlled thermonuclear power is to heat a small amount of fusion fuel (deuterium and tritium, easily produced isotopes of hydrogen found in sea water) to 100 million degrees and to confine this hot gas at sufficiently high densities and for sufficiently long periods of time for the isotopes to fuse into helium, releasing energy.

This containment and heating can be accomplished in two ways—either with a magnetic field, which diverts the electrically charged plasma (see Figure 1) or with the pressure exerted by intense laser radiation, which can crush the fuel to thousands of times the density of solid matter.

In the case of laser confinement, the technical breakthrough which is now being achieved is simply the construction of lasers large enough to compress the fuel to sufficient densities for the fusion to take place rapidly, before the particle of fuel has time to expand.

In the case of magnetic confinement, the process is more complex. The particles in the plasma will tend to spiral around the lines of magnetic field and diffuse outward only relatively slowly as they collide with one another. (Figure 2) In this type of "classical" diffusion, the faster the particles are moving, the less they are deflected by collisions, and therefore the slower they diffuse. Thus, when the plasma is dominated by random diffusion, the higher the temperature the longer the confinement time.

But things are not quite that simple. Any motion of the charged plasma, forming an electric current, produces a magnetic field. Any changes in the magnetic field produces motion in the plasma. These interactions between electric currents and moving magnetic fields are the basis of electric generators and motors.

Collective Motion

Because of these interactions, the motion of one part of plasma can draw after it the whole plasma, which then moves collectively, not as a gas composed of individual particles. Such collective motion tends to build itself up from micro-instabilities to larger scale uncontrolled motion of the entire plasma out of its confinement. (Figure 3) Sometimes the buildup is so rapid as to cause the plasma to suddenly disperse in all directions—"disruptive" instability. The problem with such collective motion or instability is that as the temperature increases, the instability, unlike the random diffusion, gets worse, since there is more energy available to be absorbed by this mode of activity.

The general problem in magnetic confinement has been to ensure that the plasma acts as much as possible in a non-collective mode, to randomize the diffusion process as much as possible and thus slow down the escape of the plasma—what might be called "plasma counterinsurgency." In addition, fusion scientists attempt to use the mutual interaction of plasma and magnetic field to positively control the plasma to create collective modes that organize and compress the plasma rather than dispersing it.

Size and Instability

The geometry of the magnetic field and the way it changes with time is therefore the main determinate of how the plasma will behave and whether instabilities will develop.

For a given geometry of a system, the larger the system is, the better, in general, it functions. This is because in a larger system, the instabilities and the diffusion processes, which propagate with a characteristic velocity, take longer to affect the larger plasma, thus increasing the confinement time. The way in which a system "scales" both with increasing size and increasing magnetic field strength can be fairly accurately predicted and the likely performance of a larger machine can be estimated before the systems are built.

Through the expansion in the size of the magnetic machines, and through improvements in the maintenance of the purity of the plasma from chemical contaminants which increase instabilities, we are now at or close to the point at which the gross instabilities, the so-called MHD instabilities which rapidly destroy the plasma, have been controlled in all major lines of fusion re-

search. This means, first of all, that the experiments have entered a stage in which increases in temperature and density tend to lead to increases in confinement time, rather than "trading off," as with earlier and more primitive models. This in turn allows the production of break-even amounts of fusion energy and the study of real fusion-producing plasma.

In this situation, the various approaches are converging on a common set of key problems and a continuum of parameters. Instead of proceeding with each different approach on its own track, concerned mainly with particular technological problems, we are at the point where it is absolutely essential that all approaches be used as "crucial experiments" in the process of studying the plasma phenomenon.

The Theoretical Problem

The new stage of fusion research also calls for an entirely new theoretical approach which brings plasma physics into direct confrontation with the fundamental problems affecting modern physics as a whole. Up to this point physicists have attempted to view plasmas in one of two ways. Either the plasma is seen as a continuous field phenomenon (magnetic-hydrodynamic fluid—MHD theory), or it is seen as a mere collection of particles, whose individual motions can be predicted by tracing them out in a computer simulation.

The particle theories, whose popularity is based solely on the reductionist prejudices of many fusion scientists, have almost always been wholly useless in acutally studying plasma phenomena, since plasma is above all characterized by collective phenomena. The MHD approach has been much more successful and has been the basic guide for experimental design until now.

In the stage fusion research is now entering, the major problem is no longer gross MHD instabilities, that is, motions of the plasma so large that the individuated nature of the ions and electrons can be ignored. On the contrary, the basic problem of controlling the so-called micro-instabilities, very small-scale collective modes which lie on the boundary between whole plasma motion and individual particle motion. Present MHD theory and particle theory are both incapable of dealing with this problem, competently. A theoretical approach which fundamentally transcends the division between particle and field approaches must be developed.

This contradiction between particle and field approaches is symptomatic of the fundamental contradictions in exactly this concept in physics as a whole. Therefore the next phase of fusion research means moving into immediate study of these fundamental problems, demanding a vast expansion and broadening of the entire basic research foundation of the fusion program.

The Major Approaches to Fusion

Given these general considerations, we can now look at the actual progress made towards fusion energy production using various approaches to the magnetic confinement scheme. We will discuss laser approaches briefly below.

There are two basic geometries used in containing the plasma: the open-ended or linear systems, in which some leakage from the ends of the system is unavoidable, and the toroidal (doughnut-shaped) systems where the ends are closed into a circle.

These two geometries can be further modified by keeping the magnetic field constant with time, or inducing changes in the field to help compress and contain the plasma.

The simplest type of device is of the open-ended static type, called the "magnetic mirror." In this device, the plasma is surrounded by a magnetic field which strengthens outward from the plasma, thus trapping it in a magnetic well. The plasma is heated by the injection of a beam of high-energy neutral deuterium atoms.

The problem with the mirror machines is that they inevitably "leak" plasma out the ends of the mirrors. (See Figure 4) In addition, since only particles in a certain velocity cone are lost, those left behind tend more and more to move collectively, and thus be subject to collective, "velocity space" micro-instabilities.

Even this simplest design shows promise. Work at Livermore Laboratory on the IIx2 mirror has demonstrated over the past few months that confinement time increases with the temperature of the plasma and the radius of the mirror, which minimizes the instabilities. Professor Fred Coensgen has laid out plans for building a large mirror, at a cost of about $100 million, which could produce net energy breakeven conditions, and temperatures of more that 1 billion degrees. Such temperatures are suficient to do important experiments, not only on the simpler deuterium-tritium reactions, but also on the deuterium-deuterium reactions. These deuterium-deuterium reactions produce charged particles almost exclusively as products instead of the neutrons produced by the deuterium-tritium reactions. This means that the energy can be directly converted into electricity at high efficiency, eliminating boilers and turbines. But ERDA has not funded Professor Coensgen's experiment.

Linear Pinches

By utilizing the interaction of the plasma and the changing magnetic field, much higher densities, and therefore greater power outputs, can be achieved than in the simple mirror. If a rising electric current is induced in a plasma along its length, the resulting magnetic field surrounding the plasma, interacting with the plasma current, serves to compress or "pinch" the plasma, simultaneously containing it and suddenly heating it. This is called the "z-pinch." Alternatively, the same effect can be achieved by inducing a circular current in the plasma and simultaneously imposing an axial magnetic field. This is the "theta pinch." (Figure 5)

Because these systems actually utilize and are dominated by the collective action of the plasma motion, they are the most susceptible to the theoretical analysis which treats the plasma as a coherent fluid—magnet hydrodynamic theory (MHD). In addition the theta-pinch is essentially immune to uncontrolled "collective" instabilities—the only losses are from the ends. By building longer theta pinches, less and less proportionately will be lost, and longer confinement times achieved. Breakeven can be achieved by the brute force approach of building a mile-long machine.

The Soviet approach under Dr. Velikhov is more sophisticated, using an intense collapsing magnetic field to compress the plasma far more rapidly and build a breakeven device only 30 meters long, called the Linus. In the U.S., ERDA allocates no money at all to this approach. The Soviet program is three times larger than the largest U.S. project, the tokamak. The Soviets are planning a breakeven experiment in the Linus in 1976.

Similarly, by merely scaling up the currents used in the z-pinches, exceedingly dense plasmas can be produced. Dr. W. Bostick of Stevens Institute has estimated that a mere $10 million could produce a breakeven machine. It has already been demonstrated that the instabilities which can develop in the z-pinch, like "sausage" and "kink" instabilities (Figure 3) can be overcome by supplying a weak axial magnetic field which would resist the bending of the plasma. Plasma-focus work is currently pursued in Italy, Poland, and the Soviet Union.

Toroidal Systems

Each of the above systems can be cured of its end losses by closing the two ends into a toroidal system. The z-pinch then becomes the tokamak, the theta-pinch becomes the Syllac, and the mirror can be made into a "Bumby torus." The problem in the toroidal systems is that the curvature means that the magnetic field is stronger on the inside of the torus and weaker on the outside, thus driving the plasma against

the outside walls. To avoid this problem there must be an additional circular magnetic field or other stabilizing device to prevent outward motion of the plasma.

The tokamak, developed by the Soviet Union in the late 1950s,remains the most successful type of toroidal device. The tokamak is basically a diffuse toroidal z-pinch in which the current in the plasma is induced by rapidly changing magnetic field. The plasma is essentially one winding of a transformer. This current both suddenly heats the plasma and pinches it. As in the linear z-pinch, a perpendicular axial magnetic field is added by external coils to stabilize the pinch, while the pinch in turn prevents the plasma from drifting to the outside of the torus. The net effect is that of a helical or twisted magnetic field. (See Figure 6)

The great advantage of the tokamak has been its relative simplicity compared with other toroidal machines. This has allowed it to be scaled up in size more rapidly in the Soviet program, thus gaining the general benefits which come with size—increasing elimination of instabilities and collective modes. Simultaneously, Artsimovich's careful engineering has reduced the impurities in the plasma, a problem which had contributed greatly to increased instability and energy loss.

Once the instabilities fell below a certain level, the tokamak passed into a new regime, where the diffusion was sufficiently close to classical (dominated by random diffusion) such that confinement time began to increase with temperature, leading to a rapid improvement in all fusion parameters simultaneously. On this basis, the tokamak program was pushed forward rapidly by the Soviets, who began operating a larger model, the T-10, this spring. Soviet scientists plan an operating test reactor by scaling up still further to the T-20.

ERDA has not only failed to push the tokamak ahead, but has practically limited its funding to a single device, the Princeton TFTF. However,even though ERDA uses the tokamak projects as its excuse for its atrocious narrowing of fusion research to a single line, the U.S. tokamak program is advancing on a slower schedule than the Soviets' and spends only a third of the money.

Problems of the Tokamak

There are several basic problems which must be solved before the tokamak can be developed as a practical reactor. First, as the temperature increases, the collisional frequency decreases, allowing more and more of the plasma to escape from the main body to be "trapped" in large banana-shaped orbits on the outside of the confinement region. From these trapped modes small-scale instabilities are much more frequent, leading to a decrease in confinement time and a return to collective modes.

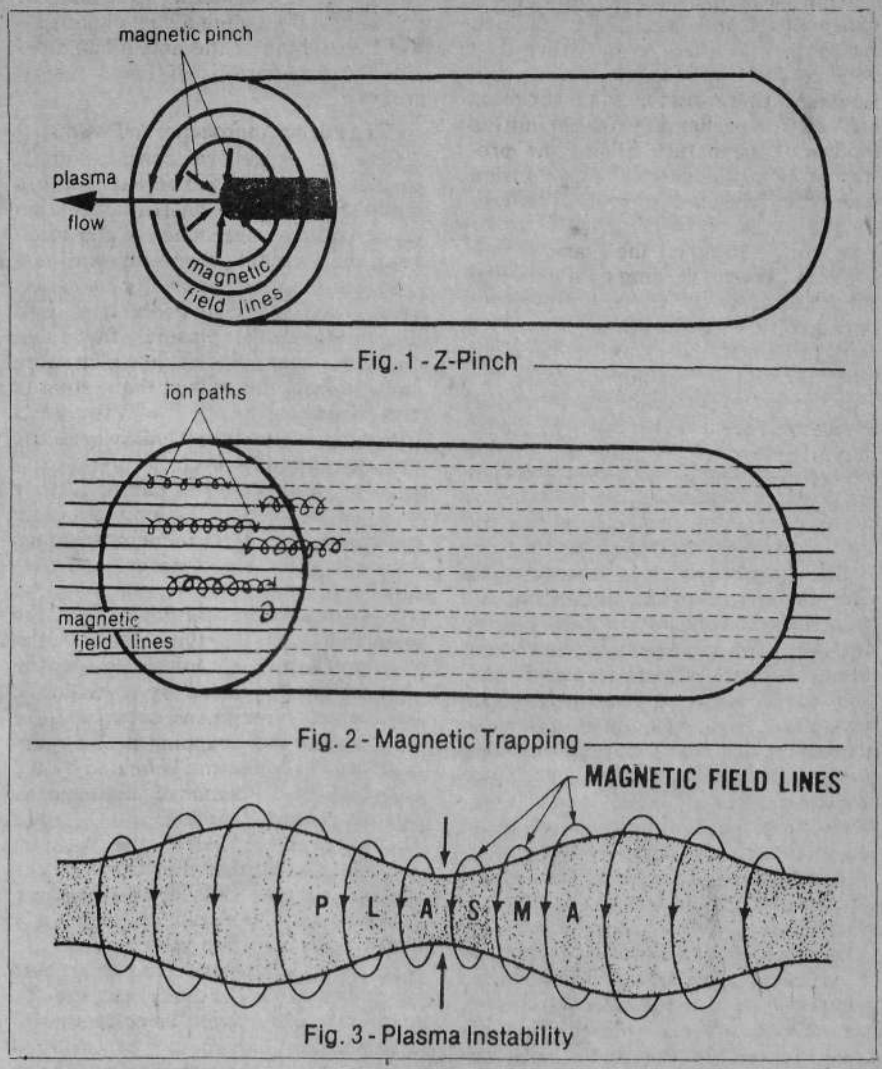


Fig. 1 - Z-Pinch

Fig. 2 - Magnetic Trapping

Fig. 3 - Plasma Instability

The recent experiments with the Alcator tokamak at MIT have shown a way to solve this problem. Operating at much higher magnetic fields than other tokamaks, the Alcator was able to increase the density of the plasma sufficiently to keep the collision frequency high with increasing temperature. In this machine, the "trapped" modes and the collective instabilities did not develop with higher temperature and the confinement time continued to increase. The Alcator also benefited from a much purer plasma than the other machines because of its excellent engineering. The confinement time also increases with density, and this threefold simultaneous increase in fusion parameters has allowed the Alcator to achieve better results than machines ten times its size. In fact, the critical product of density and confinement time is now within a factor of five of the breakeven level. With a somewhat larger machine, breakeven could certainly be reached. But as it is not a "mainline tokamak" experiment, the Alcator is barely surviving on ERDA funding.

The tokamak's relatively inefficient use of magnetic confinement and relatively low density of operation constitute its second major problem. The plasma pressure pushing outwards is contained by magnetic field of nearly twenty times larger strength pushing inwards. A balanced force would be most efficient. The low plasma pressure means a relatively low power generation density, necessitating relatively large reactors for economical operation. At presently expected energy densities a 10,000 megawatt fusion reactor, enough to supply New York City, would have to be 50 meters across and 12 meters high. Although this is not economically impossible by any means, the increasing of the density and "beta" (efficiency of magnetic field) of the tokamaks would cheapen them immensely.

There are several approaches to doing this—by increasing the temperature of the plasma through injecting high energy neutral beams, radio wave heating, and using toruses which have noncircular cross-sections, among others. The last method is being

tried by one of the major industrial fusion experiments, the General Atomic Doublet machine.

Other Toroidal Concepts

A concept similar to the tokamak is used in the stellerator, in which the plasma-generated magnetic field is replaced with a second helical field which is externally generated through windings. The double windings lead to engineering difficulties which have held up development, and caused the U.S. fusion program to entirely abandon the stellerator. In the meantime, the Soviet Union has now developed stellerators which produce results as good or better than tokamaks of the same size. Since the magnetic field is totally controlled, the stellerator has great advantages over the tokamak as an experimental tool for studying the problems of tokamak like plasmas.

The other toroidal concepts, the toroidal theta-pinch or Syllac and the toroidal mirror or "Elmo Bumby torus," have both demonstrated that their characteristics improve sufficiently with increasing scale that they too can be made to achieve breakeven condition. But ERDA plans to discontinue the Syllac work at Los Alamos within months.

Only the coordinated use of all these approaches in studying micro-instabilities and related problems can lead to success. Although these problems are of the utmost importance in tokamaks, it is in the other approaches where they can best be studied, approaches where the situation is generally less complex and more controllable than in the tokamak. Thus, for example, Dr. Bostick, working on the z-pinch, discovered that many of these micro-instabilities take the form of plasma vortices, self-sustaining "smoke rings" of plasma. This discovery of self-sustaining plasma modes is not only helpful in eliminating the micro-instabilities, but even more important, in using them and controlling them. Similarly, the Syllac, if it could be made big enough to overcome gross MHD instabilities, could, together with the stellerator, provide vital experimental conditions for studying micro-instabilities which would otherwise not be accessible to experimentation.

The ERDA policy of cutting back on all of this crucial experimental work and of failing to provide the larger machines necessary to reveal the range of phenomena not only eliminates methods of fusion achievement other than the tokamak but virtually eliminates the possibilities of solving the remaining problems with the tokamak itself.

On the other hand, it is clear that a broad-based pursuit of these lines will not only result in a half-dozen or more breakeven experiments by the end of next year, but with a self-expanding breakthrough in understanding of plasma phenomena generally, a breakthrough to progress beyond breakeven to working reactors.

We can in fact specify that an international fusion program must immediately initiate several dozen enlarged breakeven experiments, each costing in the area of $10 million to $200 million, with the majority in the $10-30 million range. Among these must be included a three-times-enlarged breakeven Alcator, a scaled up 20 meter Syllac, a 40-cm stellerator, breakeven plasma focus experiments, and scaled-up mirrors and mirror-toruses. Each of these machines should be built simultaneously in several modes with the necessary major modifications needed to test out key ideas, such as feedback stabilization, non-circular geometries, and so on.

If these machines were contracted to appropriate aerospace defense industries, working in close collaboration with the existing plasma labs and using high technology construction techniques, such a program together with necessary backup in theoretical development, physicist training, and materials research, would probably cost $4-5 billion for 1976. In all cases, the plans are already drawn up. All that is required is funding.

Lasers

Laser systems can be discussed much more briefly. The basic concept of laser fusion is to use immence powerful laser beams to squash solid pellets of fusion fuel to 10,000 times solid density and then suddenly heat them to fusion temperature, producing in effect a tiny hydrogen bomb but without the fission-radioactive core. The advances already made by KMS Fusion, which has achieved compressions of 3,000 fold, and of the large Soviet project make it clear that breakeven can be achieved by this method simply by sufficiently enlarging the size of lasers and correctly designing the pellets to be imploded. The soviet program will almost certainly achieve breakeven in 1976.

Under ERDA, the U.S. laser program is hogtied, especially by its continuing links to the weapons program and consequent "national security" red tape.

As with the more complex magnetic confinement project, the laser approach could reasonably absorb worldwide at least $4-5 billion in research on new lasers, construction of breakeven experiments, and analysis of the considerable technical problems involved in building a successful laser reactor. New Solidarity has covered in depth the strides already made by Soviet scientist Basov and his colleagues in this line.

With adequate funding of a broad research effort, literally dozens of fusion machines producing net energy could be working within a year. It is nothing short of criminal to allow the sabotage of the fusion effort to continue. Premier Miki of Japan has already proposed an accelerated program of international cooperation to develop fusion. The USLP Fusion Energy Bill is ready to be introduced in Congress. The fusion scientists are ready. We will not allow the Rockefeller machine to stand in the way.

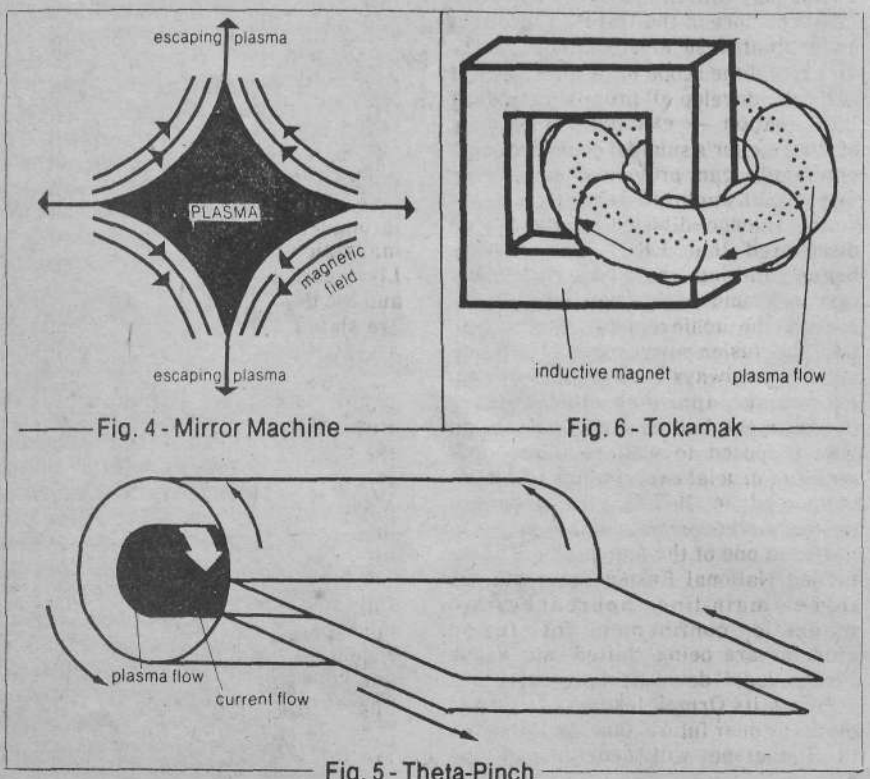


Fig. 4 - Mirror Machine

Fig. 6 - Tokamak

Fig. 5 - Theta-Pinch

THE POLITICS OF FUSION

Presidential Statement on Fusion Sabotage

NEW YORK, Oct. 12 (IPS) — Lyndon H. LaRouche Jr., 1976 presidential candidate of the U.S. Labor Party, announced today conclusive evidence of an operational policy to systematically undermine controlled fusion research as the precondition for the discrediting and extinction of the U.S. fusion program. The Labor Party has called for a full Congressional investigation of this criminal sabotage by the Rockefeller-Ford Administration and is making available to the appropriate Congressional committees complete documentation.

"The shift from a policy of retarding development to one of consciously forcing failure is now being implemented in order to eliminate the most obvious alternative to the manifestly insane Energy Independence Authority (EIA)," LaRouche said. "The EIA is the institutional base through which the demented Rockefeller brothers hope to conjure up a multi-billion dollar prop for their patently bankrupt holdings. The cost of such a scheme is nothing less than the final gutting of American industry and labor power.

"In escalating their crazed looting demands from $100 billion to $800 billion, then several trillion for the EIA — as Vice President Rockefeller did in a recent speech — the Rockefellers are demanding that the world's most advanced work force be reduced to the hand-squeezing of shale oil.

"In contrast, the development of fusion — safe, cheap, and unlimited energy — would assure the advance of the economic infrastructure necessary for the maintenance and development of the U.S. as the key sector in world development. Therefore, it is no exaggeration to say that the planned gutting of fusion is Rockefeller and Company's most criminal act to date.

"The essential feature of the operational policy to abort fusion research is the step-by-step procedure of cutting back and narrowing down the scientific base of development. The burden of achieving reactor conditions will then be left to one device, the Tokamak, which, as presently conceived, cannot provide sufficient net energy density. In fact, it can be demonstrated that, despite significant research advances, this is true for all individual fusion devices presently under development.

"Yet ERDA has eliminated any meaningful scientific work at Oak Ridge National Laboratory except as a technological adjunct to the Tokamak program at Princeton University and has stated its intention to eliminate scientific work on another approach to magnetic confinement — reportedly the Syllac-Theta Pinch. The loss will not be a mere 33 per cent; at this critical stage of scientific development, which demands that all plasma regimes be investigated in order to converge on a solution, the loss is incalculable. Moreover, ERDA has engineered a sharp curtailment of work on exploratory concepts, the obstruction of access by the Los Alamos laser fusion group to vital computer codes at Livermore, the arbitrary clamping of classification on non-governmental work, and increased harassment of leading independent researchers.

"Simultaneously," LaRouche concluded, "the CIA has attempted to obfuscate the reality of the qualitatively more advanced Soviet program through press and other attacks on U.S.-Soviet cooperation — most notably the recent awarding of a Nobel Peace Prize to dissident Soviet scientist Sakharov."

Rockefeller Revives Drive to Sabotage Fusion

by Chuck Stevens

Oct. 13 (IPS) — The Rockefeller Administration has revived the spectre of the McCarthy witchhunts in the scientific community in order to sabotage controlled thermonuclear fusion (CTR) research, the U.S. Labor Party revealed yesterday. Targeted for harassment are plasma physicists and bureaucrats in the government energy umbrella agency, the Energy Research and Development Administration.

At the same time, the Administration has ordered ERDA to produce immediate "results" in its existing CTR program while it simultaneously narrows the research to the point that no such "results" are possible. In particular, the magnetic confinement program for the development of fusion has been limited to research on only the tokamak type of reactor, while laser and electron beam pellet fusion was once again put under absurd security wraps.

The Labor Party has fully documented the facts in this two-pronged Rockefeller attack (presented below in summary form), and a campaign statement on the Rockefeller sabotage was released to the press yesterday by USLP Presidential candidate Lyndon H. LaRouche, Jr. In addition, the Labor Party is re-introducing in Congress an updated version of the USLP Fusion Technology Bill, first submitted in June 1974. The core of the USLP program is an estimated $6 to $10 billion yearly to expand the scope of fusion research and fully develop all promising lines of investigation — exactly the opposite of Rockefeller's suicidal course. Fusion potentially can provide cheap, clean and virtually unlimited energy.

The science division of the USLP discovered that ERDA has already begun limiting the scope of fusion research under the guise of accelerating the achievement of an actual tokamak fusion power reactor. ERDA's policy has always been to "select" one promising approach for further development, but the decision on fusion was supposed to wait until the next series of crucial experiments had been completed in 1977-78. The tokamak choice, moreover, will not work.

All but one of the four major ERDA-funded National Fusion Labs and the three main-line approaches to magnetic confinement of fusion plasmas are being shifted into vague "technology" developent projects:

*When its Ormak tokamak is turned off in the near future, the Oak Ridge lab in Tennessee will deal almost exclusively with engineering for tokamak reactors: producing magnets, materials, and neutral beams for plasma heating.

*The Los Alamos lab in California was warned that Syllac, the high beta toroidal theta pinch (a confinement scheme which makes efficient use of magnetic field energy) faces an immediate shutoff of ERDA funds.

*Despite major experimental breakthroughs recently achieved with the magnetic mirror machine at Lawrence Livermore lab in California, this device and the theoretical teams working on it are slated to become mere technology development adjuncts to the tokamak.

*Even in the case of significant frontier secondary efforts such as the Bitter Magnet lab's high field tokamak, the Alcator, there are now plans to turn this project over to the CIA-controlled Massachusetts Institute of Technology, downgrading work on this device to mere "educational" activities.

Although these policies are not yet fully implemented, the threatened and operational cutbacks have been sufficient to limit main-line research to one laboratory — Princeton — and one approach — the tokamak.

At the same time, auxiliary experimental work designed to thoroughly

examine theoretical hypotheses has been almost totally gutted over the last five years in order to make room for tokamak development; research in new, exploratory approaches has been severely cut back in this period.

As for laser and electron beam pellet fusion, the inertial confinement of fusion plasmas, Livermore Lab suddenly reversed the stated ERDA policy and refused to make available — even to other government labs with security clearance (in this instance, Los Alamos) — copies of LASNEX, the most advanced computer code for simulating laser pellet fusion.

McCarthy Tactics

To curtail the kind of atmosphere necessary for the development of ideas, the Administration has arbitrarily "classified" research and terrorized individual scientists. The originator of many of the concepts used for designing electron beam pellet fusion systems, for example, just had his work classified "top secret" by the ERDA Division of Military Applications. When the Division authorities informed this researcher of the "national security" reasons for this action, the fusion researcher replied: "Well, why don't you people just get the CIA to shoot independent scientists like me, and then cut us up and feed us to the scientists at your weapons labs so that they could more readily duplicate our work?"

Scientist Vincent LoDato has also been threatened with classification of his ongoing theoretical investigations. Simultaneously, he lost his teaching position at the small college where he was forced to move when his work was first "classified" in 1972.

To add to this manufactured atmosphere of paranoia, the CIA makes official visits to the major magnetic confinement labs, ostensibly to obtain information on the Soviet magnetic confinement program. Since the Soviet research has been completely open since 1956, and more than a score of U.S. scientists will take up residence at all the major Soviet labs this year in an official exchange program, it is obvious that these "official" visits are a throwback to the red-scare days of the 1950s.

In addition, ERDA officials have been spreading slanders about the Fusion Energy Foundation, an independent group initiated by the Labor Party. The FEF is an agent of a foreign power, the slander goes. An agent not of the Soviet Union, for as scientists well know, the Soviets are far ahead of the U.S. in fusion; but of Iran. The FEF, the CIA says, is attempting to "tease" out information on construction of H-bombs.

The Soviet designed and Soviet developed tokamak is accepted as the most successful approach to efficiently confine thermonuclear grade plasmas. There is little doubt that within the next year, Soviet scientists working on the T-10 model at the Kurchatov Institute in Moscow will demonstrate that the tokamak is scientifically capable of achieving "breakeven" energy production, producing more energy than is required to construct the system. But, as the Soviets note, the situation is paradoxical.

Dirty Plasmas Won't Work

The tokamak produces what is best described as "dirty plasma," so called because of impurities from the tokamak walls, and poorly understood microprocesses. On the basis of existing experimental and theoretical knowledge, the tokamak will not be able to proceed much beyond a breakeven point. The current behavior of tokamak plasmas is unpredictable, and the situation is sure to worsen as previously uninvestigated phenomena such as trapped mirror modes and synchrotron radiation appear when fusion conditions are achieved in the tokamak.

Rockefeller's Pathology

The underlying pathology which the Rockefeller fusion sabotage aggravates in the American science community is the belief that a crucial breakthrough can be accomplished by one individual or a single team led by one individual. By multiplying the same kind of experiment, this phony theory goes, computers can process numerical data and obtain the magical optimal conditions for a power reactor.

This kind of thinking, as the Labor Party has fully explained in the 1976 presidential campaign platform, obstructs breakthroughs in science. The main-line approaches to CTR must take the form of experiments designed to push the boundaries of basic science, developing an atmosphere of creative work that allows for creative breakthroughs.

Rockefeller and his ERDA dupes know that by limiting CTR to one approach and virtually one laboratory, the program is assured of failure.

U.S. Scientists Split Over Fusion

by Don Baier

Nov. 29 — Highlighting the international debate on fusion power development, an open factional split has surfaced in the U.S. scientific community with the publication of sharply contrasting articles in two leading scientific journals.

The November issue of Physics Today, the professional journal of the American Institute of Physics, is almost entirely given over the a highly favorable in-depth examination of the Soviet Union's physics research program. Included are two articles describing at length the Soviets' "broad well-balanced" multi-avenue approach to the problems of creating controlled thermonuclear reactions on the scale required to realize the potential of fusion as a cheap, safe, practically unlimited energy source for mankind in the decade ahead.

Physics Today stresses the importance of international scientific cooperation between the U.S. and the Soviets much as Japanese Prime Minister Miki emphasized joint international efforts to develop fusion in his speech at this month's economic summit.

Almost simultaneously, this week's issue of Science Magazine, the official organ of the American Association for the Advancement of Science, features a precedent-making three-page "standard CIA manufacture" slander attack on the National Caucus of Labor Committees, whose organizing for a crash fusion program over the past two years has played a key catalytic role in bringing about just such broad-based support for fusion research as the Miki proposal and Physics Today articles represent.

Fusion Gap

Included in close proximity to its slander of the NCLC, Science carried a pathetic defense of Rockefeller as the controller of U.S. science, holding him up as a kind of benevolent pork-barreler at the White House.

In devoting an issue to Soviet Physics, Physics Today is responding to a situation which the Labor Committees have previously characterized as a "fusion gap" between U.S. and Soviet researchers directly traceable to sabotage of required fusion programs by the Energy Resources Development Agency (ERDA) and Rockefeller stooge-scientists like Dr. Edward Teller and Dr. Hans Bethe.

This analysis has been widely publicized in scientific circles in the U.S. and Western Europe through New Solidarity and the Fusion Energy Foundation; the publication of the Physics Today articles, while obviously not constituting an endorsement of Labor Committee political perspectives, represents a clear acknowledgment from those U.S. physicists who want to continue some kind of meaningful work that a complete reversal of present U.S. policies is absolutely required. It is hardly coincidental that in the same issue it reports favorably on the broad-based Soviet program. Physics Today records a 26 per cent drop in U.S. government support of basic physics since 1967.

Nor is it surprising that the physicists take note of two features of the Soviet program in particular; its diversified approach, in stark opposition to the

straitjacketing of U.S. research to "mainline tokamak" efforts, and its effective central direction by the Soviet Academy of Sciences, light-years beyond the calculated bumbling of ERDA. Of the Soviet Academy, Physics Today says perhaps a bit wistfully, "Although fewer in number than the members of the U.S. National Academy of Science, the academicians of the Soviet Academy are responsible for providing the leadership for the Academy's vast network of research centers employing some 100,000 scientists.

An indication that the Soviets intend to stress their fusion effort even more strongly is the recent appointment of Academician A.P. Aleksandrov, for the past 15 years head of the Kurchatov Institute, described in Physics Today as the site of the largest Soviet fusion program, representing nearly half of the total national fusion effort. In announcing Aleksandrov's appointment to head the Soviet Academy, CPSU Central Committee member Suslov emphasized, "the party attributes first degree significance to basic scientific research...basic research and its results exercise a profound influence on all aspects of human activity, on raising the effectiveness of social production...and lay out the new highroads of... progress."

ERDA Plans More Sabotage

by Eric Lerner

Nov. 15 — Fusion researchers present at the Plasma Physics Conference of the American Physical Society in St. Petersburg, Fla. this week endorsed an international crash program for the development of fusion power. Simultaneously, pro-development industry circles have strongly endorsed the expansion of the U.S. fusion effort. This convergence of renewed scientific ferment with increased industrial interest in fusion research threatens a full exposure of the Energy Research and Development Administration's (ERDA) sabotage of controlled thermonuclear fusion development.

ERDA representatives at the St. Petersburg conference hoped to downplay recent Soviet fusion breakthroughs in the Tokamak T-10 and laser fusion research with calculated slanders of the Soviet fusion effort. Ignoring conference reports to the contrary, ERDA insisted that the Soviet program was really not all that good.

Fusion in the Open

An editorial and lead article on the collapse of the nuclear fission industry in the Nov. 17 issue of Business Week indicates the growing factional alignment behind fusion. Widely read by the business community, Business Week stated bluntly that the U.S. energy program "must be re-oriented." Citing the "exponential growth" of radioactive wastes from fission reactors as a potentially unmanageable problem, the editorial urges the government to "shift the emphasis of the (nuclear energy) program...Instead of launching a massive push for more fission plants — including breeder reactors which produce fissionable plutonium as a by-product — the U.S. should pour more money into fusion power, which uses hydrogen isotopes....Fusion's promise of clean, controllable, efficient power is too good to pass up. The U.S. should put the brakes on the breeder program and push hard for fusion.

This week, the Baltimore Sun, a widely read daily, correctly labeled fusion power as "the best hope" for solving the world's energy problems. The much-touted solar energy alternative was relegated to a mere secondary priority.

Industry Backs Fusion

Industrial representatives, particularly within the agricultural machinery sector, are similarly backing the expansion of the U.S. fusion program. Hans Voss, Executive Vice President of International Harvester, the leading manufacturer of tractors, informed IPS this week that International Harvester representatives are tremendously impressed by the Soviet fusion program. "The Soviets told us they would be producing power from fusion by the mid-1980s," Voss said. A few days later, Harvester representatives said they would consider lobbying in Congress for a crash fusion effort.

A representative of Caterpillar Tractor, the second leading producer of agricultural and construction equipment, was sent to the St. Petersburg conference on Plasma Physics to gain information on fusion. The representative informed IPS that Caterpillar is considering private investment in the development of fusion power.

Fusion Scientists Factionalize

More than 1500 world fusion researchers attended the Plasma Physics Conference in St. Petersburg. The heads of nearly every U.S. fusion laboratory entered into informal alignments to reorient the crippled U.S. fusion program towards a broad-based approach with primary emphasis on basic research — a necessary requirement for the successful development of fusion power in the next decade. In private discussions, the scientists attacked ERDA policy of limiting fusion research to the single Tokamak machine at the Princeton Plasma Physics Lab. Such a singular approach would virtually assure the failure of fusion development.

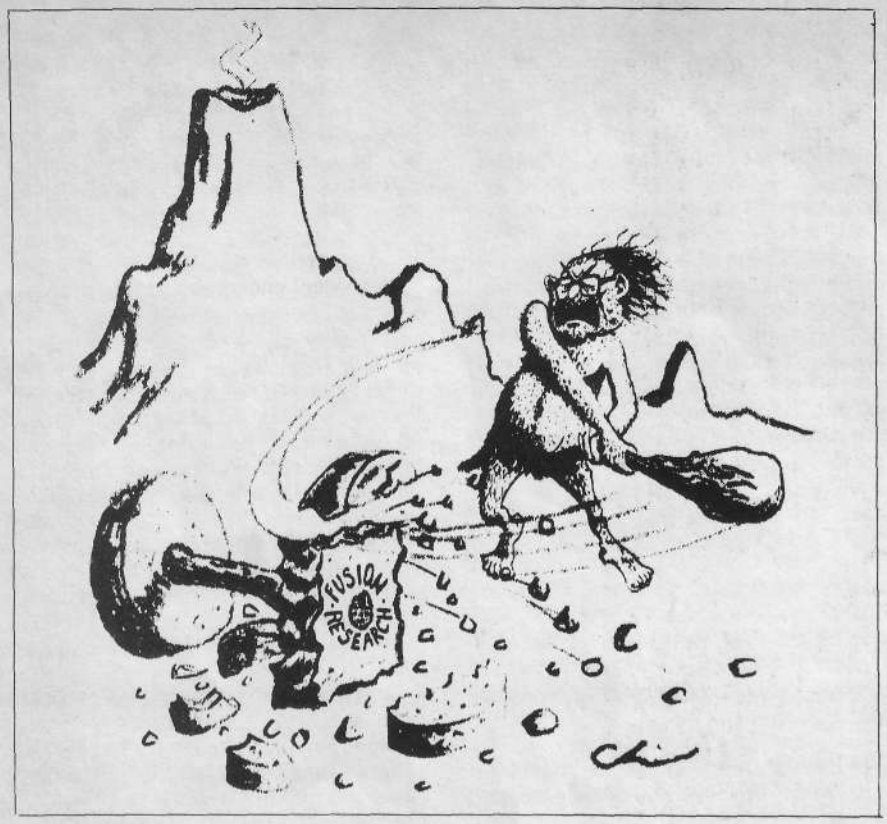
In fact, on the first day of the conference, ERDA's Division of Military Applications classified a conference paper on "Very High Gain Pellet Configurations in Laser Fusion" which was to report on the work done at the Lawrence Livermore Lab in Calif. on the structure of laser pellets for inertial confinement fusion.

Two scientists have agreed to talk to members of the staff of the Senate Government Operations Committee, who next week will begin investigation of ERDA's sabotage of fusion.

Faced with growing opposition to the ERDA program, ERDA officials reacted with typical blundering. ERDA head Robert Seaman mysteriously failed to show up for his scheduled presentation, while Robert Hirsch, head of the Controlled Thermonuclear (fusion) Research division, attempted to create a controlled environment for the discussion of the fusion program. To cover for ERDA's policy of the "one road" to fusion development, Hirsch took advantage of President Ford's proposed $28 billion general budget cuts to threaten major cuts in the fusion budget. In particular, the important Syllac theta-pinch machine at the Los Alamos Lab would be terminated. According to sources at the conference, Hirsch had stated earlier at Los Alamos that "the science phase of the controlled thermonuclear research effort has been completed. Technology is now the major object of the program." Hirsch did "not want any bad mouthing of the Tokamak."

Research reports presented at the conference were sufficient to show that the single track program just will not work. In case after case, plasma physicists reported on major advances in other approaches to fusion development. The Soviet and West German scientists reported that the Stellerator machine a variant long ago dropped in the U.S., achieved plasma confinement comparable to or even better than the Tokamak. Scientists from Lawrence Livermore and the Francis Bitter Magnet Labs reported that if recent successes with the respective Mirror and Alcator machines were followed up by new major experiments, their experimental work would reach breakeven conditions in the next few years.

Soviet progress in both the Stellerator magnetic confinement approach and the laser-inertial confinement approach prompted ERDA to circulate their slanders of the Soviet program. According to this whispering, "The Soviet Tokamak leaks... their Stellerator is not as good as they say...their laser work is just not competent." But U.S. scientists were fully aware that the Soviet approach has put them years ahead of the U.S. effort. The Soviets' Tokamak program is scheduled for power production in the early 1980s.



Legislators Check Fusion Sabotage

by Joe Marques

WASHINGTON, D.C., Oct. 29 (IPS) — A highly placed source in Congress revealed yesterday that Senate investigators are now attempting to determine whether the Rockefeller-dominated Energy Research and Development Administration (ERDA) has sabotaged the United States fusion power program. Indicating that Rockefeller attempts to quarantine the U.S. Labor Party program for crash-fusion development from Congress have been broken, the source stated that the investigators are planning to contact scientists connected with the fusion program to determine how the program is being carried out and if it can be accelerated.

"It looks to me that fusion may be the only way we can go for energy," the source said. "No one here on the Hill likes either coal gasification or fission. When you mention solar energy or thermal or wind, everyone in the room laughs."

Tunney Backs Fusion

This disclosure follows by days the publication of two articles by syndicated columnist Tom Braden which reveal that Sen. John Tunney (D-Cal.) has launched a Capitol Hill fight for a massively increased U.S. fusion effort to replace the nation's costly fission program and Rockefeller's proposed $600 billion Energy Independence Authority (EIA). Tunney, Braden reports, "has met with stiff bureaucratic resistance to his efforts to learn from ERDA why the United States is not moving swiftly to develop energy from nuclear fusion instead of relying on the dangerous process of nuclear fission."

The answer, Braden writes, is "that the major oil companies, particularly Exxon and Arco, and major manufacturers like General Electric and Westinghouse...have invested so heavily in nuclear fission that Congress' growing interest in other energy sources threaten their applecarts."

Braden also drops a major political bombshell: "The Russians made a major breakthrough this summer...by using lasers to produce atomic energy by fusion." "**This breakthrough**," he says, "**may well have put the Soviets 10 years ahead of the United States in the race to develop safe, renewable sources of energy.**" (IPS is the only major news source in North America which has covered the news of the Soviets' laser fusion advances.)

A "Manhattan-type project" for fusion," Braden writes, "may well determine whether this country remains prosperous." As for Rockefeller's widely ridiculed $600 billion EIA, it "would underwrite — at the consumers' expense and risk — the effort of the major corporations to sink the nation even more deeply into the nuclear fission method."

ERDA, CIA React to Soviet Gains in Fusion

by M. Levitt

Sept. 30 (IPS) — The intelligence and energy bureaucracies of the Rockefeller Administration have signalled their profound panic at the march of Soviet fusion research toward scientific breakthrough with a series of clumsy attempts to intimidate fusion scientists. These watch-dogs of science hope their actions will prevent the politicization of the heretofore demoralized and domesticated U.S. science community.

In the past month, a number of U.S. physicists — several collaborators with the U.S. Labor Party-initiated Fusion Energy Foundation (FEF) — have been selectively harassed in an effort to stop them from following their European colleagues' lead.

* A talented nuclear-plasma scientist, fired in 1972 for coming up with a potential breakthrough in fusion-fission hybrid design, was recently offered a New York State grant if he could obtain an institutional sponsor. The only possibility, the University of Rochester laser fusion lab, is funded by Exxon and the federal government's Energy Research and Development Agency (ERDA), but officials at the lab claimed they were "too busy" to write a simple letter of agreement for him. The scientist, who has been in communication with the FEF, remains unemployed.

* Prior to the Gordon Research Conference on Laser-Plasma Interactions, which was held in August, ERDA officials warned scientists at the government's Los Alamos and Livermore Laboratories about the dangers of meeting Fusion Energy Foundation and Labor Party spokesman Chuck Stevens at the conference. Stevens was at the time in the process of writing a series of scoops on the broad-ranging Soviet breakthrough efforts in fusion research

* A paper submitted by an independent researcher to an upcoming scientific meeting was recently impounded by the ERDA Division of Military Applications, supposedly because it impinged on "classified" areas. The author, in conversations with FEF, indicated that this was his "reward" for consistently proposing alternatives to the concepts guiding research in ERDA's "open" programs.

* The scheduled opening speaker at the FEF's Oct. 11 seminar on the structure and content of fusion research suddenly withdrew last week, claiming in a letter that he **now** had nothing but the highest regard for ERDA's handling of fusion research. The same sort of letter was "solicited" last year from an FEF member under threat of reprisals against colleagues at a government lab.

CFR Calls Fusion 'Last thing we'd share'

by Don Baier

Nov. 22 (IPS) — A panic-stricken spokesman for a top Rockefeller policy-making body, the Council on Foreign Relations (CFR), revealed this week that the Rockefeller forces are going all-out to sabotage international collaboration for rapid development of controlled nuclear fusion power. Such collaboration was proposed by Japan at last weekend's Paris economic summit.

The CFR spokesman indicated that the Coordinating Committee to Control Exports (COCOM), a multi-nation NATO-vintage economic warfare agency empowered to block shipments of "strategic" materials and technology to the Soviet Union, would be an important aspect of the attempted wrecking operation.

The CFR self-exposure occurred in a telephone interview with an independent journalist, who noted during the conversation that Japanese Prime Minister Miki's summit speech on behalf of International Development Bank trade and credit arrangements and rapid fusion development had included a call for relaxation of COCOM restrictions. The spokesman promptly exploded.

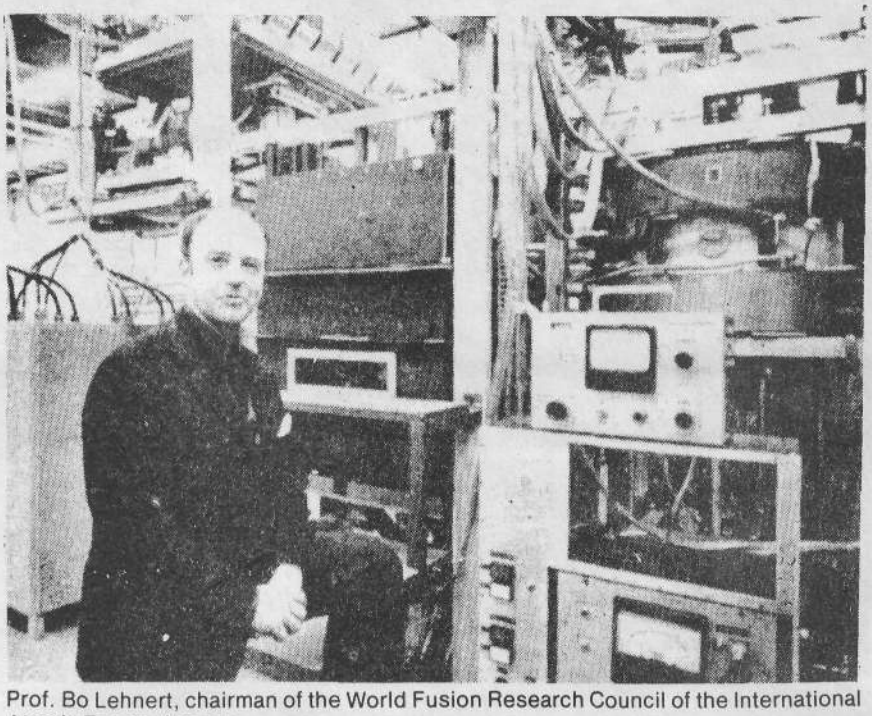
"Fusion is at the top of the list of COCOM restrictions," the spokesman shouted. "It would be the last thing we'd share with the Soviets, we'd sooner share the ballistic missile."

Asked whether he foresaw joint Japanese-Soviet collaboration to advance fusion technology if the U.S. refused to participate in international efforts, the spokesman responded hysterically, "The Japanese wouldn't dare make such agreements with the Soviets; they depend too much on us for their trade. They know what we could do to them...."

At the present time, Japan, Great Britain, Italy, and the Soviet Union are reportedly engaged in various bilateral and multilateral negotiations aimed at bringing an international crash fusion program into being. Confirming Japan's efforts was a report this week that a leading U.S. fusion research institute, whose negotiation with Japanese universities on joint fusion research has been bogged down in red tape for months, had recently received an urgent renewed request for its cooperation from the Japanese.

Indicating the sophistication of Japan's own researchers, well-placed scientific sources have told IPS that in certain fields the Japanese opened up a considerable "fusion gap" over U.S. and European scientists hamstrung by Rockefeller sabotage of basic research.

Several leading U.S. scientists are now formulating serious long-range fusion policy alternatives for presentation to Congress. Several Congressmen are reportedly considering investigating the Rockefeller dominated Energy Research and Development Administration which is now keeping the lid on research. Two significant straws in the wind: in the past week J. R. McNally, head of the notorious ERDA laser fusion non-program, has resigned his post, and Democratic Presidential candidate Terry Sanford has declared, "If I were in charge (of government energy policy) I'd push fusion."



Prof. Bo Lehnert, chairman of the World Fusion Research Council of the International Atomic Energy Agency.

Lehnert Calls for Crash Fusion

STOCKHOLM, Sweden Nov. 24 (IPS) — In a exclusive interview with IPS last week, internationally known fusion scientist Bo Lehnert revealed that he and an international circle of scientific collaborators are mapping a drive for a crash program to develop a workable fusion power reactor.

Prof. Lehnert, a member of the Swedish Royal Institute of Technology is chairman of the World Fusion Research Council of the International Atomic Energy Agency, and a member of the Board of Editors of Nuclear Fusion, the world's leading fusion research journal.

"Prof. Rebut, the chief of the 'Big Jet' project (Joint European Tokamak — ed.) is in complete agreement with me about a crash program being necessary," Prof. Lehnert said, and emphasized that scientists throughout the world are now devoting intense discussion to completion of the so-called Big Tokamak projects underway in the U.S., the USSR, Europe and Japan.

Prof. Lehnert expressed concern about what he views as a mistaken tendency to focus fusion research on only one method: "This goes for the research in Europe, but as well in the U.S.A. where the government is focusing almost exclusively on the Tokamak."

Lehnert called for an intense push on all other developing possibilities in order to achieve success. "This included among other things, so-called theta pinch and mirror principle as well as laser and electro-beam principles," he said.

Prof. Lehnert also repudiated recent statements by press and political authority for the view that fusion power is not possible before the year 2000. "What I have said," Prof. Lehnert emphasized, "is that with the present low economic financing of fusion research, fusion power cannot be realized until after the year 2000. On the contrary, I want to insist that with a real international crash program where the entirety of possible resources are deployed, fusion power can be realized much earlier."

PCF Defends Fusion Research

Oct. 28 (IPS) — The French Communist Party (PCF) last week began a vigorous counterattack against the proposed dismantling of the French Atomic Energy Commission (CEA), announcing that the Commission would be vital to the implementation of fusion power. In an interview published by the PCF daily, L'Humanite, Oct. 23, CEA engineer Claude Aufort, a member of the PCF, warned that "when we want to have fusion go from the domain of fundamental research to that of applied research, if we don't have a CEA, we will run against colossal problems which we might not solve."

The PCF warning comes as Rockefeller forces are attempting to effectively dismantle both the French and the European Common Market's (EEC) fusion programs.

The EEC recently slashed the European fusion program budget from £20 million to £4 million, a move which will leave the program enough to pay its scientists' salaries, but no money to purchase or maintain equipment. According to the British journal New Scientist of Oct. 16, t' decision to make the cut was engin d by the Rockefeller-influenced W t German government, on the guise of "fighting inflation." The West Germans reportedly motivated the crippling funding slashes on the grounds that EEC cuts in other sectors, such as agriculture, were politically unfeasible.

In France, Rockefeller agent President Giscard has been moving rapidly since June to completely dismantle the CEA, which until now has represented not only a research and development bastion for French industry, and the heart of France's fusion program but is also one of the few French scientific institutions in which theoretical, applied, and engineering work is promoted as an integrated totality for national economic development.

The CEA now plans and operates all phases of nuclear energy work from basic research in a number of fields to commercial delivery of nuclear generated power. Under the Giscard proposals, this integrated operation would be broken up into several discreet components: the CEA's fuel cycle operation will become a mere service branch for private industry; the CEA itself will be forced to purchase a 38 per cent share in the Rockefeller-linked nuclear multinational, Framatome, and the CEA's theoretical work will be isolated into a separate "Fundamental Research Institute."

Moreover, the government is also attempting to impose "productivity" and "profitability" strictures on CEA researchers, including the creation of rigid job guidelines which will severely restrict the free flow of personnel and ideas between research and engineering sections.

The PCF is charging that the Giscard proposals will transform the CEA into an intellectually impotent, "piecemeal" operation similar to the U.S. Energy Research and Development Administration. Blasting the regimentation and fragmentation of research which would result, PCFer Aufort said that "we know very well that the development of human capabilities is linked to the concretely practiced opening of the mind. (Giscard's plan) is destroying the conception of Jolio-Curie (the PCF founder of the CEA), who wanted to create an organism where there would be this symbiosis (between theoretical and applied work)."

The PCF has countered the Giscard-Rockefeller fusion sabotage with a five point program of its own, calling for the immediate temporary use of all national energy resources; a new type of international cooperation based on state to state relations; absolute priority for fundamental research, especially in fusion; nationalization of energy production and distribution; and adequate funding, recruitment of scientists, and support of multidisciplinary research within a framework of democratic workers' and scientists' rights in CEA.

European Fusion Research Threatened

Oct. 19 (IPS)—Rockefeller forces are now threatening controlled nuclear fusion research in Europe as part of their drive to eliminate the otherwise feasible possibility of achieving a fusion power based world economy by the end of this century.

In a letter to the editor in the Oct. 14 Financial Times, Sir Alan Cottrell, Professor at Cambridge University, warns that proposed cuts in the European Economic Community research budget just reported to the European Parliament may threaten plans to proceed with the Joint European Torus (JET) project in development of fusion.

Cottrell argues that "it would be a tragedy for Europe if this project were not to go forward," since fusion offers "possibly even the only (hope)" for meeting future energy needs. "Although many difficult technical problems have still to be solved", research can and must move ahead since "no fundamental barrier exists to the generation of energy from controlled thermonuclear fusion."

Prof. Cottrell's warning and support for fusion is more than timely in light of NATO efforts to re-militarize the European economy along Mussolini-Third Reich lines, and the insanity of Rockefeller's plans for energy-"independence" in the U.S. However, Cottrell assumes, it is "absolutely right for Europe to take its place alongside" the Soviet Union and the U.S. with its **own** "continental" tokamak program, the only existing device to reach breakeven conditions.

As the ICLC has made clear only a scientifically broad-based, fully internationalized fusion research program can assure fusion reactor development by the 1980s. The necessary partner in "European" research and development is the Soviet Union. Prof. Cottrell's England, for example, under conditions of international development as specified in the ICLC's International Development Bank proposal, could expand its own threatened base at the Culham Lab and elsewhere in "high beta" and laser-fusion research.

Dr. Motz Issues Fusion Call

Oct. 17 (IPS) — Lloyd Motz, Professor of Astronomy at Columbia University in New York, issued a statement yesterday urging trade unionists and politicians to support the U.S. Labor Party call for expanded fusion power research and a Congressional investigation of the Rockefeller Administration's sabotage of fusion.

"Any policy that could stymie the development of fusion by cutting back on research goes against the real interests of the country and is deleterious to the well-being of workers," Motz said. "I intend to look into this situation, and urge elected political leaders and trade union officials to support fusion research as proposed by the U.S. Labor Party, and to endorse the call for a Congressional investigation."

Motz, a former president of the New York Academy of Sciences, is one of the foremost physical scientists in the U.S.

Labor Party organizers across the country are taking the Motz endorsement and Labor Party fusion petitions to scientists and science professors, trade unionists, and political leaders for endorsement.

Aides to Senator Lee Metcalf (D-Mont) and Representative Marvin Esch (R-Mich) indicated that both legislators are what one aide termed "pro-fusion." Metcalf, who is reportedly interested in an investigation of the Rockefeller Administration (ERDA), sits on the Government Operations Committee which can demand an accounting of ERDA's budgetary allocations. Esch is on the house Science and Technology Committee.

LaRouche Statement on MIT Fusion Results

by Lyndon H. LaRouche, Jr.
U.S. Labor Party Presidential Candidate

Nov. 7 (IPS) — The widespread media coverage of the public announcement on Nov. 5 by Energy Research and Development Administration (ERDA) Director Seamans of the encouraging results of the most recent series of experiments at the Francis Bitter National Magnet Laboratory's Alcator tokamak installation, is intended to justify the present controlled thermonuclear fusion (CTR) program of the U.S. Instead the results of the Alcator installation provides striking corroboration of the U.S. Labor Party's policy statement Oct. 14 which indicated the necessity of placing basic scientific research at the center of CTR work, in order to achieve the general scientific advances needed to successfully produce useful fusion-generated energy.

Dr. Seamans' characterization of the Alcator advances as "A major development in the fusion power program (which)...exceeds by a factor of five anything previously achieved anywhere in the world," is misleading in at least two important respects.

First, the Alcator project is the exception, rather than the rule, with respect to ERDA's CTR science policy. Contrary to Dr. Seamans' intimations, the Alcator has not been an integral part of the main-line tokamak development program, nor do the Alcator's latest results in terms of plasma density and confinement time in any way justify ERDA's present over-emphasis on solving what it imagines to be mere "engineering" problems standing in the way of fusion reactor development — an approach defined in ERDA's June 30, 1975 report calling for a funneling of all CTR resources into the Princeton tokamak project beginning in 1976.

Keep an Idea Alive

The Alcator project exists only because of determined efforts to keep it alive by its scientific staff, and because of their ability to produce results which could not be ignored even by ERDA. While the project has recently been granted a several million-dollar contract by ERDA, it is well-known that throughout its crucial early development period it was under constant threat of funding cut-off.

Second, the significance of the Alcator results is not to be found in Dr. Seamans' reference to the record value achieved for the product of plasma density and confinement. We are not engaged in some international weight-lifting contest, but in the life-or-death necessity of achieving net-energy producing fusion reactors in time to replace depleted fossil resources. The plasma regime produced in the Alcator device is providing scientific insights into plasma behavior which may prove crucial to achieving reactor conditions, but only the misinformed will swallow Dr. Seamans' attempt to portray the present program as converging on such a result.

International Collaboration

Much more than ERDA's equivocal and tardy support is behind the Alcator concept. It has basically been the result of international collaboration between teams at MIT under Bitter Lab Director Ben Lax and project Director Ron Parker and at the Italian Nuclear Research Facility at Frascati. The theoretical work has been led and coordinated internationally by Prof. Bruno Coppi of MIT with the explicit intention of exploring and comprehending the behavior of the relatively high-density "collisional" tokamak mode which can be achieved using precision-engineered high magnetic toroidal fields. It now appears, from the definite pattern of the Alcator results, in which confinement time is scaling with plasma density, that a larger Alcator-type machine scheduled to become operations next year at Frascati, will approach or reach fusion breakeven conditions.

Few, if any, scientists would make any such prognostication about the present main-line ERDA tokamak program, for which not even qualitative understanding of scaling results exists.

The Alcator results provide a striking indication of what could be accomplished if all hypothetical plasma modes and geometrical configurations were scientifically explored, while reactor prototype and engineering studies with an appropriate spectrum of experimental devices were being simultaneously undertaken.

Informed sources have advised us that in light of the Alcator results and growing Congressional disaffection with ERDA's general, as well as specific CTR policies, ERDA has frozen capital expenditures for CTR, and the CTR division is "re-evaluating" its program. The result must not be permitted to be a simple new "lease on life" for projects, such as the Syllac Theta Pinch, otherwise slated to be axed, coupled with public relations-oriented to a "more broadly conceived" approach. Nor should there be a switch from defense of one artificial timetable to its revised bureaucratic replacement.

Time for A New Manhattan Project

It is time now for Congress to independently determine the funding and organizational requisites for a new "Manhattan Project" approach to fusion, which would definitively replace imbecilic Rockefeller Energy Independence schemes as our national energy policy. The recent USLP memorandum to Congress on conducting an inquiry into the history and present status of U.S. fusion research is adequate to initiate the process of overcoming the "fusion gap."

Imagine the result if the resources to be pooled were not simply those of small groups at MIT and Frascati, but represented the combined scientific and technical muscle of the U.S., Soviet Union, Western Europe, Japan, and even scientifically rich Third World countries such as India.

Japan Sets Up Fusion Agency

Nov. 18 (IPS)—The Japanese Atomic Energy Commission (JAEC) has announced its intention to establish a "Fusion Council to promote a coordinated development plan for controlled thermonuclear fusion research and development. The new agency will also organize international cooperation in fusion, and will promote the training of fusion scientists. The announcement was made Nov. 11 by chairman Sasaki of the JAEC — who is also head of the Japanese Science and Technology Agency — and reported in the Nov. 11 issue of Japan Economic Journal.

Operational Immediately

The council will apparently become operational immediately; two leading scientists and officials have already been named to it. The announcement is the first move to implement Japanese Prime Minister Miki's proposal for an international commitment to fusion development made at the just-concluded economic summit at Rambouillet, France.

SPECIAL FEATURE

The Sakharov Case

by Dr. Morris Levitt

The recent award of the Nobel Peace Prize to "dissenting" Soviet physicist Andrei Sakharov, as a much ballyhooed "peace-loving victim of totalitarian orthodoxy," climaxes a cheap television melodrama directed by the CIA.

To begin with, the Soviet dissenters movement which Sakharov purportedly represents is a hoax. No such group exists as an actual Soviet social formation. A handful of pathetic individuals, whose essentially reactionary social outlook is most clearly expressed by the expelled nostalgiamonger of Tsarism, Alexander Solzhēnitsyn, is being manipulated by Anglo-American intelligence circles primarily for the purpose of demoralizing Western scientists and intellectuals about the prospects for the further development of human progress.

In themselves these people, Sakharov included, are entirely unimportant both with respect to their immediate collective impact on Soviet society and their long-term influence on world events. The sophisticated agent operation which sustains their performance, however, can be traced to Fabian origins dating back more than 40 years ago. In the interests of worldwide scientific collaboration on behalf of humanity, it is high time this operation was eliminated.

The Anglo-American intelligence authorship and present control of the Sakharov swindle is best indicated by reporting that in 1973 Sakharov signed something known as Humanist Manifesto II. This document had nothing to do with actual humanism, as represented by the Renaissance tradition, and more recently, the development of German Critical Philosophy which reached its apex in the work of Karl Marx.

The Manifesto was authored by Paul Kurtz, a philsophy professor at the University of Buffalo with connections to U.S. Air Force Intelligence.

Kurtz is the prize pupil of Sidney Hook, the chief academic redbaiter of the 1950s McCarthy witchhunt period. During the 1960s and 1970s, the Kurtz-Hook University Committees for a Rational Alternative played right-wing intellectual cops,maintaining "law and order" on U.S: and Western European campuses by purging genuine leftists and intellectuals. San Francisco State President S.I. Hayakawa, who won national notoriety for his police-state headbusting tactics against student strikers, was a typical UCRA stalwart.

The Bestialists

Hook and Kurtz publish a magazine, also called the Humanist. The magazine has awarded Sakharov the prize of "Humanist of the Year"; another so honored was B.F. "Ratman" Skinner, the fascist psychologist who asserts that men have no minds. Racialists Arthur Jensen and William Shockley, both of whom attribute congential intellectual inferiority to blacks, have published frequently in the Humanist, as has British quackademic H.J.Eysenck, most recently noted for efforts to prove the congenital inferiority of the entire working class. The Humanist is more properly called the Bestialist.

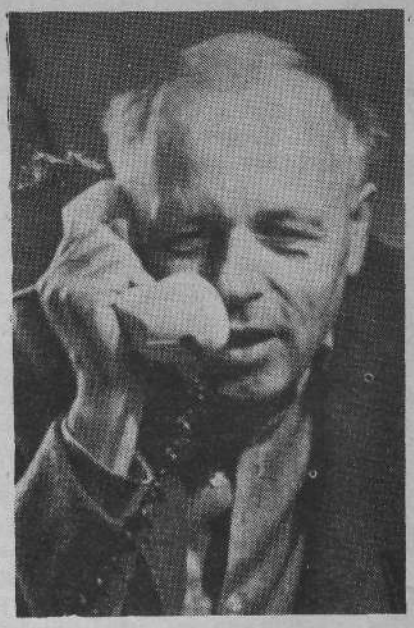
In signing the Humanist Manifesto II, Sakharov was joined by Eysenck, Skinner, Zero Growth crackpot and science-fiction pornographer Isac Asimov, and Rockefeller food control specialist Lester Brown. Soviet emigre Alexander Volpin, a mathematical logician, and Yugoslav Svetozar Stojanovic, Philosophy Professor at Belgrade University were the only other non-U.S.-British signers.

The basic propositions of the manifesto dovetail with so-called "convergence theory," essentially the nonsense that the Soviet Union and Western capitalist countries have gradually been growing ever more alike in their basic institutions and policies.

Manifesto I

There is nothing essentially new in this class-collaborationist "evolutionary" approach — indeed it was pioneered under Humanist Manifesto I. That literary secretion appeared in 1935 under the imprimatur of America's leading "pragmatic philosopher," John Dewey, at a time when Kurtz' present close collaborator, Sidney Hook, was a budding "Marxist" luminary on the basis of his plagiarized rendition of British Fabian Society agent Karl Korsch's "synthesis" of Marx and existentialism. In no major feature did the original Manifesto deviate from the moral philosophy of Mussolini.

According to Dewey and his fellow "humanists," 1933 was a year of unrivalled scientific achievements ushering in a "deeper appreciation of brotherhood." Therefore, the time had come for discarding old forms of universalizing religion and constructing a secular religion providing fulfillment in the "here and now." First, of course, one had to learn to "face crises in terms of their naturalness and probability." Then



Andrei Sakharov

"reasonable and manly attitudes will be fostered by education and supported by custom," and "social and mental hygiene...discourage sentimental and unreal hopes and wishful thinking" - like eliminating the capitalist financier class. Finally, Dewey's minions incanted, a new religion which permits "joy in living" will usher in the "quest for the good life" in "a social and cooperative order" which "must replace profit-motivated society."

In 1933 the Humanists invoked their perverted vision of "one world" because it looked like European fascism and its corporatist Anglo-American controllers would have the muscle to crush the isolated Soviet Union and all remaining allied working class movements. Forty years later they could only hope that a few Soviet pilgrims might be drawn to the cathedrals and sanctuaries of the remodeled "new" religion, and that the Soviet Union would be embarassed at how "ideological" is was not to exercise the new right discovered by the Humanists in the 1970s — the right to commit suicide.

Sidney Spills the Beans

If Sakharov's well-known fantasies about the "convergence" of the US and Soviet systems did not arise from any organic ferment to **that** end within the Soviet Union, what then was their origin? A recent interview with veteran agent Hook, as well as other extant sources, provides a partial, but generally satisfactory answer. When asked for sources of information on the Sakharov case, Hook — reached by a reliable source at his office in the CIA think tank Hoover Institute — recommended getting in touch with the New York branch of the International League for the Rights of Man, the umbrella for the Sakharov-

Solzhenitsyn operation in Moscow. Hook also mentioned I.I. Rabi, a retired Nobel Laureate physicist who was close to J. Robert Oppenheimer and instrumental in the Pugwash Conference meetings between Soviet and U.S. scientists. The reference to Pugwash, a series of secluded meetings between presumably pro-detente, anti-nuclear war Soviet and American scientists, indicates the conjunctural conditions under which Anglo-American intelligence operatives anticipated the "capture" of at least some well-known Soviet scientist, and for which there is empirical evidence in the Sakharov case.

From the time of the development of the Soviet atomic (fission) and hydrogen (fission-fusion) bombs, U.S. policy makers sought in vain for some military-psychological stance that would permit a non-suicidal military confrontation with the Soviet Union. The first generalized social "movement" aimed at undermining Soviet nuclear resolve, or failing that, at recruiting politically weak Soviets as the predictable "fall-out", was the Anglo-American "Ban the Bomb" operation. This was the brainchild of British Labor Party psychological warfare expert and confessed Goebbels fan, Richard Crossman. The up-front man was decrepit Fabian pacifist Bertrand Russell who earlier in the postwar period had called for a U.S. nuclear attack on the Soviets.

Ban the Bomb

The anti-Bomb movement created a milieu, by "leaking" information and stressing the dangers of radioactive fallout, in which there appeared to naive persons to be an **equivalency** between the U.S. and Soviet Union in terms of the threat they represented to the rest of the world, and an apparent **symmetry** in terms of their geopolitical aspirations with respect to each other. Any particular "positive" initiative advanced from this situation of "equivalency" would supposedly identify which party was acting in good faith. The object, of course, was to eliminate actual strategic **parity** and the resolve to enforce mutually assured destruction (MAD). Never mind that the Soviets had consistently called for a total ban and destruction of all nuclear weapons, as opposed to "limitations" and "monitoring" — the CIA's "juridical" approach. The Committee for a Sane Nuclear Policy — SANE — was the principal U.S. analog of the British group.

The Ban the Bomb Movement combined with the period of adjustment in the Soviet Union after the 1956 Twentieth Party Congress denunciation of Stalin, set the stage for the more specific conjuncture in the early 1960s out of which Sakharov began his career as a professional dissenter. The effect, however, of the late 1950s is reflected in Sakharov's comments in his autobiographical **Sakharov Speaks**: "Beginning in 1957 (not without the influence of statements on this subject made throughout the world by such people as Albert Schweitzer, Linus Pauling, and others,) I felt myself responsible for the problem of radioactive contamination from nuclear explosions."

When the Kennedy Administration came to power in 1960, the entire nuclear weapons situation was destabilized, not only Kennedy's demagogic campaign around the fictional "missile gap", but more importantly by Secretary of Defense McNamara's experimentation with strategies of "controlled and flexible" nuclear warfare. In June 1972 McNamara declared the U.S. was developing "first strike"capability against the Soviets. The McNamara scenario "mix",ranging from first strike to limited tactical warfare, sufficiently destabilized the strategic environment that a new round of missile and warhead development and testing ensued.

In its wake, the Soviets demonstrated to the RAND psychotics the definitive Soviet political resolution and technological capacity to maintain the inviolability of the doctrine of MAD. But if Sakharov's memoirs are to be believed, he saw this whole period as a series of mere bureaucratic "power politics" moves by Khrushchev.

Sakharov Remembers

"I remember that in the summer of 1961 there was a meeting between atomic scientists and the chariman of the Council of Ministers, Krushchev," writes Sakharov. "It turned out that we were to prepare for a series of tests that would bolster up the new policy of the USSR on the German question (the Berlin wall). I wrote a note to Khrushchev, saying, 'To resume tests after a three-year moratorium would undermine the talks on banning tests and on disarmament, and would lead to a new round in the armaments race — especially in the sphere of intercontinental missiles and anti-missile defense.' "

In the year of the Cuban Missile Crisis Sakharov wrote, "...Another and no less dramatic episode occurred in 1962. The Ministry, acting basically from bureaucratic interests, issued instructions to proceed with a routine test explosion that was actually useless from the technical point of view...Realizing the unjustifiable, criminal nature of this plan, I made desperate efforts to stop it...."

Sakharov, if his statements are taken at face value, had capitulated to the illusion of Soviet "inflexibility" programmed into the CIA arms escalation-limitation (hard-soft) policy.

Ironically, scientists such as Sakharov had already begun to play a role within Soviet society, which, in conjunction with the break-down crisis of capitalism and the reawakening of international working class forces, could provide the sensuous knowledge of changing the world that had certainly been tragically limited or absent during the period of Stalin and the disarray or destruction of the Western working class.

In the 1940s Sakharov, a brilliant student, studied under one of the leading all-round Soviet physicists, Igor Tamm. He and Tamm then worked on the development of the Soviet H-Bomb and on the origins of the technology of controlled fusion. In 1950 the team laid the basis for Soviet theoretical work in the fusion field, which led into many subsequent ground-breaking Soviet developments in fusion.

In addition to being able to take the widest possible initiatives in science, Sakharov also took up successfully substantive issues of science and social policy, fighting against the dilution of education by proposed job training in high schools in the late 1950s, and against the re-introduction of Lysenkoism in biology in the early 1960s. Yet, by 1966, Sakharov abandoned these forms of intervention that are coherent with a meaningful concept of freedom and human development and lent himself to the intended artificial "polarization" of Soviet intelligentsia around the trial of "dissident" writers, Sinyavsky and Daniel.

'All Rolled Into One'

From that period, Sakharov also apparently abandoned the task-orientation of fundamental theoretical fusion studies to embark on scientific work which by1969 had led him to the fashionably esoteric but epistemologically ridiculous notion of a cosmological sea of anti-quark particles. The state to which Sakharov had reduced himself by latching onto all the worst features of reductionism in political and scientific thought was captured with unintended irony by New York Times Kremlinologist Harrison Salisbury, in introducing the 1968 publication of Sakharov's **Progress, Coexistence, and Intellectual Freedom** in the Times. To Salisbury, Sakharov had become the whole gallery of Anglo-American-intelligence-controlled U.S. atomic physicists, "Oppenheimer, Teller, and Hans Bethe all rolled into one."

This marked full circle for the spread of Humanist rot from the infamous 1933 Manifesto, as Sakharov's "philosophical" work had been self-admittedly motivated by his real or postured fear that "the division of mankind threatens it with destruction." (Emphasis added). His answer? Dissolve all differences in a common "humane" structure and value system "beyond" capitalism and socialism.

This final consolidation of Sakharov as a defacto agent was not surprisingly also characterized by a proliferation of symptomatic intelligence contacts. His second wife, whom he married in 1970, was Yelena Bonner, an activist in dissident and Zionist circles. Her nephew, Eduard Kuznetsov, was among a group charged with attempting to hijack a plane in Leningrad to fly to Israel. In 1970, Sakharov sent messages to Presidents Podgorny and Nixon asking for clemency for the Zionist hijackers and CIA neurotic Angela Davis!

By the 1970s Sakharov was plugged into other CIA "fig-leaf" cover operations such as Amnesty International, tied to Cambridge anti-Soviet operative Noam Chomsky of MIT (ardent admirer of all heteronomic political movements from that of the Kulak Makhno to the Kronstadt anarchists), which has continuously tried to set up a "local" in Moscow.

Media controlled by Swedish Social Democratic agent Olof Palme has also served as a continuous conduit for Sakharov's stylish pessimism. Even the left-CIA factional opposition to nuclear "chicken" games, best exemplified by the Federation of American Scientists (FAS), controlled by Director Jeremy Stone and physicist Hans Bethe, consistently uses Sakharov to stake out its own claim to the anti-Soviet "convergence" turf.

The Left-Wing Version

The branch of Anglo-American operations indicated by the case of Sakharov represents the efforts by Hook and Kurtz to use the phony "materialism" of earlier agents Bernstein, Bebel, and Kautsky against the Communist movement. Manifesto II signer Stojanovic of Yugoslavia fills out the story, in terms of the use of the Korschian or neo-Kantian "Revolutionary Young Marx" ideologies on the Communist movement. While the Soviet operation has centered on the use of logical positivist vulgarizations common to bourgeois and backward pro-Marxist thinkers — Hook has conveniently been attacked by the New Left for renouncing his early "Marxism" although in reality, he merely switched brands of synthetic ideology — the Yugoslavs, and the Poles, as in the case of Michael Kolakowski and Adam Schaff, were profiled for subversion of Marshal Tito's revolutionary communist cadre outlook through so-called "Marxist-Humanism."

The latter operation has been a lot jazzier than the soap opera of Sakharov et al., Marxist "sensuality" oozing back and forth between operations control in the person of Prof. Robert Cohen of the Boston University Philosophy of Science program and the Frankfurt School outpost of "do your thing" philosophy in the Belgrade faculty. Cohen can still attempt to finesse ideologically what the former "Young Hook" is now too senile to fake —given the unresolved political situation in "non-aligned" Yugoslavia and the sewer connections between Cambridge-Boston and other "Marxist-Humanist" outlets.

Flop

In the Soviet Union itself, the Sakharov operation has gone nowhere. In a fit of candor in the January 1973 issue of the Humanist, Volpin admits the total artificiality and definitive outside control of the highly touted Soviet dissidents movement. After reviewing the "highlights" of dissident activism, which included the gathering of liberals in defense of the Soviet Constitution in Pushkin Square in December, 1965, the founding of the Chronicle of Current Events in 1968, the setting up of the Initiative Group for the Defense of the Rights of Man in 1969, and the penultimate Moscow Human Rights Committee in 1970, Volpin lets a few white cats out of the bag.

The total number of activists was never more than a handful of physicists, and literary figures led by the morbid mystic Solzhenitsyn. Most of their activity was directed at and mediated by foreign journalists and journals (Humanist, of course) because, by Volpin's own testimony, there was hardly any Soviet audience for their work. In fact, by 1973, Volpin could comment from the "safety" of the U.S. that "it is evident that there are insufficient forces for further development of the struggle, that the struggle is near extinction and no new forces are visible. Only Zionists (since they receive help from Zionists abroad) and such known members of the Moscow Human Rights Committee as Sakharov . . . and the writer Solzhenitzen are in a relatively favorable situation. I do not wish to say that this movement is ending, but foresee a pause for several years in its activities with only the strong support of known Western cultural figures preventing this pause."

There never was a significant indigenous dissidents movement during the late 1960s and 1970s! The "celebrities" that could be generated were conceived by themselves and the CIA as merely the focal points for an outside "juridical" movement to raise the issue of Soviet conformity to the International Covenants on Human Rights, to which it was a signatory. According to Volpin, the liberals had no program other than institutionalizing the right to any form of "dissent," and then perhaps to form parties around different forms of dissent.

Fixing the Prize

Despite the weakness of the dissidents, fixing the Nobel Prize for Sakharov was easy enough. For those credulous enough to consider pure non-political decisions by a group of neutral Scandinavian oracles, a look at the 'distinguished" individuals composing the leadership of the Nobel Foundation itself is instructive. The Nobel Foundation itself, according to the terms of the will left by dynamite inventor Alfred Nobel, is led by Dr. Ulf von Euler, of the Swedish Karolinska Institute, himself a Nobel winner for work in mind-destroying amphetamines. The Deputy Chairman, Tore Browaldh, is on the Board of the Hudson Institute thinkptank of Herman "Megadeath" Kahn and responsible for that institute's making of Volvo the world model for fascist speedup 'teamwork' schemes.

The subcommittee responsible to the Foundation for awarding the Peace prize consists of five people, the most notorious of them being a Norwegian, Dr. Johm Sanness, who has been a collaborator of Anglo-American intelligence services since at least the 1940s. Sanness is a member of David Rockefeller's Trilateral Commission and is Director of the CIA-connected Foreign Affairs Institute in Oslo. With such "impartial" gentlemen determining these awards it is indeed no surprise that Sakharov joins Anglo-American agent Willy Brandt and butcher Henry Kissinger as winner of this year's Nobel Peace Prize.

Why?

The only question is; given the decrepit state of the dissidents, why did the Nobel Committee bother? After all, Rockefeller never rewards washed-up accomplices.

Sakharov was simply all the bankrupt Rockefeller cabal had at its disposal to cover up the rising ferment of scientific vitality and political purposiveness of the Soviet scientific community, especially in Sakharov's own abandoned field of fusion. His case was to serve the purpose of reinforcing the demoralization and alienation (in the rigorous Marxist sense of denial of supportive, dialectical relationship to the process of human cultural and material development) which Western scientists and intellectuals have experienced since the onset of the Cold War. However, the response to the fusion question in the U.S. and Europe, exemplified by the rebirth of intellectual ferment from MIT to the French nuclear agency, is indicative of how long ersatz-humanist and zero growth ideology may expect to command an audience outside of the Rockefeller Foundation or the UCRA-Humanist network.

History produces some just ironies. In the final analysis, Sakharov deserves the Peace Prize — for helping to develop the Soviet H-Bomb. Without that check to the Rockefellers and their successors there could be no possibility of a relatively peaceful transition to workers' governments now.

SPECIAL FEATURE

The Oppenheimer Case and the Destruction of Science

by Dr. Morris Levitt

In an effort to pump some life into the otherwise dead counterforce debate over "acceptable" levels of death in a "limited" nuclear war between the U.S. and the Soviet Union, the name of J. Robert Oppenheimer has recently been resurrected. Oppenheimer, a top nuclear physicist who was "martyred" during the McCarthy period for his Communist associations and initial reluctance in developing the hydrogen bomb, has lately figured prominently in a feature article in the Scientific American written to the specifications of Defense Secretary James Schlesinger's own RAND Corp. "disarmament" experts. The general theme being developed over the body of the now rehabilitated Oppenheimer is exemplified by "arms control" specialist Herbert York — "He was right after all to oppose the H-bomb; nuclear parity with the Soviets could have been maintained without it."

Nothing could be more idiotic than this attempt to lure the Soviet Union into an acceptance of the idea of "limiting" nuclear warfare. As Soviet statements and actions have amply demonstrated, recent Congressional and National Academy of Sciences studies of nuclear casualty scenarios have no strategic competence or relevance whatsoever. Not even a smokescreen constructed of Oppenheimer's ghost will in any way alter the reality of absolute Soviet commitment, if given no choice about waging nuclear war, to use its total arsenal against U.S. population centers.

But the invocation of Oppenheimer ironically underlines what every scientist with any trace of self-respect must soon come to recognize — that fundamental scientific inquiry has come to a dead standstill in the U.S. since the days of McCarthy. It has not been possible to impose political conformity without also destroying the world outlook required to penetrate the deepest theoretical problems of physical science. The 1954 public vilification of Oppenheimer was the final nail in its coffin. What has passed for theoretical science in the subsequent two decades has actually been the application of theories developed in the 1920s. Oppenheimer — and the entire world scientific community were the objects of murderous Anglo-American intelligence operation whose dimensions they could only dimly perceive.

Let us be clear that what is at stake in the Oppenheimer case has nothing to do with rectifying an "injustice" done to another martyred innocent. Innocents are usually martyred — and worse. The international Communist movement has the right appropriate jurisdiction in the Oppenheimer case, not because Oppenheimer was a poor fellow traveler, but because only Marxism as an organized worldview can comprehend and so intervene to bring about the conditions under which actual advances in science can again be realized as generalized progress, as in the crucial development of controlled thermonuclear fusion power. Removing the muck of the Oppenheimer affair and its consequences are simply a necessary part of that job.

To comprehend the full damage done by the Oppenheimer affair, it is necessary to appreciate that before the emigration to the U.S. of Albert Einstein, Enrico Fermi, and other physicists in the 1930s as a result of the Nazi barbarism imposed on Germany by finance capital, there was no "homegrown" U.S. science beyond the "tinkering in the basement" of, say, Thomas Edison. The quality of fundamental theoretical competence represented in the wartime development of the atomic bomb was wholly dependent on the overall guidance and direction of a relative handful of European scientists, exemplified by Einstein, trained in the intellectual heritage of the French revolution and German critical philosophy (Kant-Hegel-Feuerbach-Marx).

Oppenheimer, whose fellow traveler ties to the Communist movement and watered down internationalism-pacifism represented a tendency toward the broader social outlook and humanist assumptions of the "Europeans," was deliberately victimized by the Anglo-American intelligence cabal as an object lesson to other scientists.

In that same period, the cabal brought to full flowering the logical positivism transported 20 years earlier from the Vienna Circle, whose nonsense about the importance of "value-free" judgments for scientific thought was the perfect rationalization for the moral imbecility to which most scientists more or less condemned themselves in the aftermath of the Oppenheimer affair. Such was the general nature of the operation.

More specifically, the well-known features of the Oppenheimer case revolved around Oppenheimer's October 1949 convening of the General Advisory Committee (GAC) of the Atomic Energy Commission (AEC) to draft a policy recommendation on H-bomb development, and the McCarthy-style hearings conducted in 1954 to smear Oppenheimer as a security risk by publicizing his past Communist associations and opposition to the H-bomb project.

As Oppenheimer admitted in a 1949 letter to Harvard President and cabal scientific watchdog James Bryant Conant, whether or not to proceed with the H-bomb was never seriously in question — by that point the organizing of the Anglo-American conspirators had already created a Cold War hysteria in which not to build the bomb would have been nearly inconceivable. Under the circumstances, any effective opposition would have to have been based on a general political-philosophical perspective which identified the creative scientist's role in the vanguard of human progress. Instead Oppenheimer, along with many other atomic scientists, did not publicly dissent from the decision on "purely moral" grounds, although privately this was exactly their understanding; they simply argued that it was strategically unnecessary.

It is not necessary to go into the details of those proceedings to establish that Oppenheimer was **singled out** for a McCarthy-style smear job. The membership of the GAC **unanimously** concurred in opposition to launching H-bomb development. This opposition reflected the positions of such OSS-CIA agents, inside and outside the GAC, as Conant and David Lilienthal respectively. Other "liberal" and European-trained scientists on the Committee, like I.I. Rabi — for example — suffered no such consequences.

Even more significantly, the policies of arms "control," "limitation" of use of nuclear weapons, "inspection" of nuclear sites, and generalized forms of supranational "federalism," which were implicit in the Oppenheimer-GAC position, were precisely the ultimate tactical objectives of the most sophisticated Anglo-American anti-Bolshevik strategists. Indeed, Oppenheimer was himself involved with these circles in numberous ways, including as a board member of the notorious Twentieth Century Fund. To the impotent pacifist Oppenheimer, leading cabalist Conant

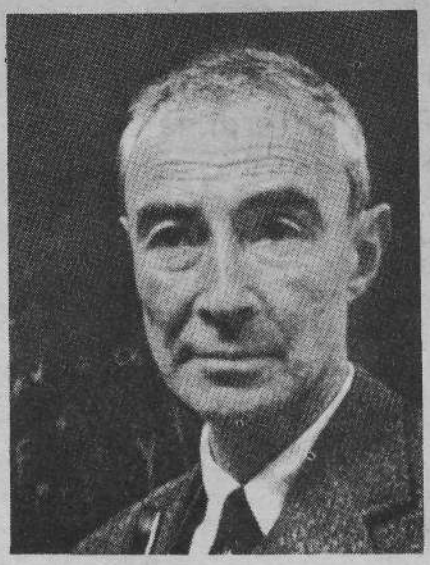
was literally "Uncle Jim." To the cabal, however, Oppenheimer was the symbol of a nascent internationalism, which however compromised, had to be destroyed.

Edward Teller's role as the wild anti-communist hatchet-man used on Oppenheimer is also by now equally well known. Teller has always openly consorted with the Rockefellers — serving as policy maker for everything from the Commission on Critical Choices to the LEAA. Recently Vice President Nelson Rocke-feller proclaimed him "my own scientist." What has never been adequately understood, however, is the role of "covered" agents, "progressive" in the Oppenheimer affair. These agents, best exemplified by Hans Bethe, defined the acceptable limits of moral and political "choice" for physical scientists. A minimal number of **crucial** junctures in Bethe's deployment, when mapped against the consistent areas of application of his scientific expertise, are sufficient to establish the pattern of his agentry.

Bethe underwent a miraculous conversion in the early 1950s from being willing to work with Teller on the H-bomb and considering the acceptance of extra compensation for so doing by pro-bomb AEC Commissioner Strauss, to campaigning throughout the country against the "Super," supposedly because of its awesome destructiveness. But while scaring the wits out of the population, if not the Soviets, Bethe was, according to York, simultaneously pushing for a giant A-bomb of roughly comparable destructive capacity.

Despite his associations with anti-bomb scientists such as Oppenheimer and Szilard, Bethe was named to a prominent position as a leading scientific advisor at the first nuclear arms control and disarmament talks with the Soviets in 1958-59, well before the staged "rehabilitation" of Oppenheimer in 1963. In 1961 Bethe published jointly with Teller a "debate" on nuclear policy — "The Future of Nuclear Tests," sponsored by the Rockefeller's Foreign Policy Association. While differing on the question of cessation of nuclear weapons tests, the "antagonists" decisively **converged** on the strategic outlook of limited nuclear warfare known as the Schlesinger Doctrine.

Although Bethe was a leading and vocal opponent of the Nixon Administration during the onslaught of the arms "controllers" against the ABM boondoggle, in the spring of 1975 he remained aloof, even after extensive direct briefings by the International Caucus of Labor Committees, from any comment on the demonstrable danger posed by the activation of the Schlesinger Doctrine. Strange behavior indeed for an original member of the



Dr. J. Robert Oppenheimer

Emergency Committee of Atomic Scientists!

Bethe has maintained an hegemonic expertise in fission reactor theory and safety technology throughout the entire post-war period. (His earlier efforts to be useful to Anglo-American intelligence before and during the war centered more on missile aerodynamics and the "physics" of exploding shells and armor-plate.) During the recent era of "energy crisis" he has changed his position on the breeder reactor with the fluctuations in the energy capital markets before settling on an "independence" scenario (well publicized by his cohorts in the American Physical Society) based on a "pluralist" approach which converges on the Rockefellers' policy.

Despite having done major scientific work on the fusion reaction cycle in the sun, for which he received the Nobel Prize in Physics, Bethe has never been involved in doing or advocating controlled fusion research as a priority. Hans Bethe has never had reason to worry about his mild defense of J. Robert Oppenheimer.

Cutting Off the European Head

With the purge of Oppenheimer, U.S. physics and science in general had its "European" head cut off and was turned into a leaderless group, controlled by the positivist ideologues and operatives such as Bethe, the model "non-partisan" scientist. The "Europeans" had been necessary to maintain coherent control over rapid developments in applied science during the wartime period. Such developments were not to be tolerated, however, in the post-war world. Those scientists who might want to actually rebuild the world after the war, who could empathize with the rational kernel of the Soviet system, who wanted to immediately jump into large-scale controlled fusion development, had to be taught a lesson.

At first, their well-cultivated "guilt" over the Bomb was used for controlling their positive impulses in the immediated post-war period. With the Oppenheimer case, this psychological lever was viciously inverted, so that pacifist internationalism had to be publicly exorcised as the sin of "disloyalty." The scientists' guilt at being tainted with "dirty" production was tapped yet again in the late 1960s orgy of "ecology" brainwashing.

The predictable result was the destruction of any generalized pro-Soviet, i.e., pro-development tendency within U.S. science. More generally, this meant the fragmenting of universal labor on a global scale and the general alienation of science from cooperative labor throughout the advanced and undeveloped sectors of the Dollar Empire. U.S. scientists were controlled along "hard-line", "liberal," "pragmatic," and later "ecological" orientations as applied science was geared to aerospace-military junk (later pollution and energy control), and heteronomic "theory" was steered into particle chasing or proto-fascist bastardizations of "holism." In this climate, nothing could thrive but paranoid "individualism" and the scientific "empires." The defining characteristic of the scientist was the almost total renunciation of the basis for retaining a coherent identity as a scientist.

The roots of the "sabotage" of fusion operationally, therefore, can be located in the destruction and intimidation of scientists (through the example made of the wretched Oppenheimer) who could, in a **different** environment, have potentially provided directly or stimulated a synthesizing applied science in conjunction with further development of the Einstein-Schrodinger tradition of theoretical profundity; in putting men like Teller (and now Seamans) in charge of significant sectors of the research program; and in elevating "clean" fellows like Bethe to set the limits and objectives of broader policy discussion for the scientific community as a whole. Those otherwise relatively honest and independent scientists within and without the fusion program are therefore now lacking any principle of scientific epistemology or experience of social organization of science that would permit them to go beyond complaining about curtailment of their work **as individuals**, when they are not otherwise quietly accommodating to the totalitarian environment of their work.

For those still blind to these psycho-sociological realities or the possible existence of alternative practices, one need only reference the relative superiority of the Soviets-strategic deployment of scientists and support for basic research which is conclusively

evidenced by the growing "Fusion Gap."

Oppenheimer was broken and supplanted by the Tellers and Bethes not merely as a "mistaken" — or even planned — Cold War epiphenominon, but to open the way to a permanent, escalating assault on the tradition of humanist progress.

It is that dual effect of repression — on epistemology and moral purposiveness — which the by then hegemonic positivist "philosophers" of science, transplanted from the Vienna Circle, could not and did not understand. For them the "phenomenon" of the world could not be "structured" other than in a way amenable to the capitalist financiers to whom they looked for patronage and swore fealty. The fact that under those conditions of stagnant capitalist political economy (in "theory" and practice) science was sufficiently emptied of its dialectical content so as to apparently conform to their neurotic, projected "value-free" version, was then taken as proof of their silly assumptions, traceable to Hume, about the process of scientific development!

As the growing contradictions of postwar economic processes under the hegemony of mere bankers were tirelessly obscured and hysterically denied by especially the "Marxians" of this ilk, the crucial tension, necessary for creative work in theoretical science, which is provided by the conscious examination of fundamental antimonies was buried by the positivists' rampant indifferentism. It is only since economic (if not ecological) collapse has become obvious to even these charlatans that the core fascist content of their work has emerged into daylight in forms such as collaboration with CIA Rev. Moon's "unification of science and absolute values," and it has become necessary for them to defend their miserable notion of science against astrology. The details of the importation and growth of the twentieth century apparat of the positivists in the U.S. must wait to be developed in a future article.

The psychological wreckage this has left in science will not be instantly overcome. The Soviet Union itself, the primary target of ideological and political agentry now being exposed by the ICLC, has only just begun to emerge from the blunting of its own self-consciousness about the Marxist praxis of globally unifying universal and cooperative labor. But the reawakening of Soviet hubris and the growing Western working class and demands for scientific program in the form of an appropriate material basis for fusion research — made possible by the programmatic and scientific work of the Labor Committees — are the first therapeutic steps.

FUSION AND DEVELOPMENT

Fusion Scuttled For Free Enterprise Energy

by Dr. Morris Levitt

Oct. 21 (IPS) — On behalf of oil magnate and Vice-President Nelson Rockefeller, Dr. John Foster delivered the Ford Administration's new "energy policy" to scientists at Livermore Laboratories in California, a major U.S. fusion research site. Foster, a former head of Livermore, announced that since scientists had failed to advance 'energy development," "free enterprise" would take the field with the aid of Rockefeller's proposed $100 billion coal and fission boondoggle.

Foster explained that fusion power also would become the domain of free enterprise — a direct Rockefeller attempt to sabotage fusion research totally. Foster's announcements are part of a coordinated Rockefeller assault on a multiprogram approach to develop controlled thermonuclear fusion power, which is urgently required as the source of energy for worldwide development.

Agriculture Expert: Fusion Our Only Hope

by Matt Moriarty

Nov. 11 (IPS) — "We must use our intellects to develop fusion energy as our only hope," declared Dr. Wesley Buchele, Professor of Agricultural Engineering at Iowa State University, speaking at the fourth forum on "The Politics of Development" in New York sponsored jointly by the U.S. Labor Party and the Fusion Energy Foundation.

"We are entering the last quarter of the 20th century uncertain of our ability to feed its projected 6.5 billion people because we may lack the energy necessary to do so, he said. Without the commitment to overcome the finite limits of fossil fuels with fusion energy, Buchele emphasized, "the only possibility is to return to labor intensive agriculture as practiced 3,000 years ago."

Buchele is one of several scientists and engineers who have collaborated with the Fusion Energy Foundation to develop a crash program for expanding food and agricultural production. Introducing the discussion, Eric Lerner, U.S. Labor Party R and D Director, pointed to the immediate political necessity of Dr. Buchele and allied scientists in agricultural and related fields joining with the Labor Party drive to implement the International Development Bank. This would ensure a Manhattan Project-type commitment to fusion power development and would provide the necessary credits to expand agriculture production worldwide, he said.

Iran To Sponsor Fusion Project

Sept. 2 (IPS)—Several leading U.S. fusion researchers revealed in interviews today that Iran plans to sponsor a major fusion energy research effort. Iran's brute force program is based on building a linear theta pinch machine over 100 meters in length to explore the possible applications of thermonuclear power. Further research will explore fission-fusion hybrids and possible desalinization and production of hydrogen from seawater using the linear theta pinch machine.

Recently, Iranian representatives have visited leading fusion research laboratories both in the U.S. and Western Europe to recruit physicists for their CTR program. One representative is reported to be visiting the Los Alamos Scientific Laboratory this week. The theta pinch, one of the few magnetic bottles to achieve the conditions needed to produce fusion energy, is the chief focus of research at Los Alamos, using a closed, doughnut shaped theta pinch.

One problem with linear theta pinches is that they must be made over one kilometer long in order to reach net energy producing conditions. The largest now operating in the U.S. is eight meters long and plans to build a 40 meter theta pinch have yet to be acted on by ERDA.

Soviet Rep At Chi Meet Calls For Expanded Trade

CHICAGO, Oct. 22 (IPS)—Soviet Diplomat Victor Isakov, speaking yesterday at the Chicago Council on Foreign Relations, called for expanded industrial and agricultural trade and cooperation between the U.S. and the Soviet Union.

During informal discussions following the meeting, Mr. Isakov was asked about the Soviet views on developing thermonuclear fusion power. He responded by declaring that the Soviet Union is determined to develop fusion energy "by the early 1980's as the only energy source capable of getting us through the next decade." Asked who he thought was responsible for sabotaging the U.S. fusion research effort, Isakov simply pointed to a front page picture of Nelson Rockefeller in New Solidarity, saying "Why don't you ask him?"

TASS Statement On Sakharov Prize

The following statement on the award of the Nobel Peace Prize to Soviet physicist Sakharov was signed by 72 of his fellow members of the Soviet Academy of Sciences. This statement was released by the Soviet press agency TASS on Oct. 25.

Soviet scientists, like the entire peace-loving public, are deeply satisfied with the positive development of international life towards detente and the strengthening of peace. With hope in the future, we have greeted the results of the Conference on European Security and Cooperation as an important step on the path to overall peace. Together with progressvie scientists from all countries, Soviet scientists have always been for peace, friendship and cooperation among peoples. We fully share and support the peace-loving policy of the Soviet Union. Therefore we cannot fail to express our dismay and disturbance in connection with the Nobel Committee's awarding the Peace Prize to Academician Sakharov, whose activity is directed towards subverting peace and peaceful relations among states and to kindling mistrust among peoples.

People of good will on earth know that the USSR is consistently conducting a policy of peace and detente, and that it is precisely the Soviet government which has taken the initiative and consistently comes out for banning atomic weapons tests, for reducing armaments and armed forces, for respecting the principles of sovereignty and noninterference in internal affairs in relations among states, and for rejection of force and threats to employ forces. Sakharov on the other hand, fights against this policy and calls on the West not to trust the Soviet state, to conduct a "hard" line in relations to it, to demand as "payment" for detente a rejection of the fundamental gains of Soviet power, that is essentially to let capitalism develop freely in our country. He speaks of the danger of detente, and in unison with anti-Soviets in the West he sows fear with the military threat supposedly coming from our country.

The "Unfortunate" Sakharov

Sakharov consistently supports those who have more than once with their aggressive actions brought international tension to the brink. He has condemned American military circles not for aggression in South Vietnam and Cambodia but for "insufficient decisiveness and consistency" in carrying it out, and he has called the freedom and peace won by the Indochinese patriots a "tragedy." He has condemned those countries which support the just cause of the Arab peoples who are struggling against Israeli aggression.

Declaring himself a defender of humanism and human rights, Sakharov has expressed the hope that the Pinochet regime will open an "epoch of renaissance and consolidation" in Chile. He is "shaken" by the fate of the "unfortunate Hess" --the close associate of Hitler who was condemned by the International Tribunal for fascist crimes against humanity. The Nobel Committee, indeed, proclaims Sakharov "the voice of conscience of all humanity."

Under the guise of struggle for human rights, Sakharov acts as an opponent of the peace-loving Soviet foreign policy and our socialist order. He slanders the great political, economic, social and cultural gains of the Soviet people. We are therefore not surprised by the racket raised in the West around this prize by certain circles who are interested in breaking off detente and resurrecting the cold war, and who seek pretexts to tarnish by any means the noble goals and sincerity of Soviet foreign policy which has gained general recognition and popularity all over the world.

For true advocates of peace, the decision of the Nobel Committee to award Sakharov the Peace Prize is unacceptable, as it fundamentally contradicts the spirit and letter of the basic principles of this prize. Soviet scientists consider that the awarding of the Nobel Prize to Academician Sakharov is unmerited and provocational in character and is a mockery of the noble ideas of humanism, peace, justice and friendship among the people of all countries, which are dear to us all.