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11 October 1951

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Colonel Kenneth E Fields
Director of Military Application
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Colonel Fields:

From time to time we are aware of a rather thinly veiled criticism to the effect that the rate of progress in atomic weapon research and development at the Los Alamos Scientific Laboratory is inadequate to the national need. We are obviously not in a position to contest the validity of this criticism other than to invite attention to the somewhat ironic fact that every current weapon development has arisen out of the suggestion (and in many cases, the urging) of this Laboratory.

One possible way, of course, to speed up eventually the rate of weapon research and development is to establish additional laboratory facilities, presumably at some new site. This is the suggestion, occasionally made, to set up a "new Los Alamos". We regard this proposal as one which could hardly show much accomplishment within two to four years, would present serious difficulties of staffing, would result in considerable duplication of effort and expenditure, and which would consume a rather considerable amount of time and effort between the two installations in the essential endeavor of keeping in touch with each other, no matter how much care was put upon program determination and division of effort.

This proposal has been seriously made in connection with the thermonuclear program. It is dubious if its implementation at this time could do other than delay the date at which the next significant thermonuclear experiment might be made. However, careful planning might, through the establishment of an appropriate laboratory (or through its attachment to an existing installation) speed up the conversion of an explosive thermonuclear experiment to a militarily useful weapon.

The establishment of a new laboratory to participate in the development of implosion type weapons seems to be somewhat more questionable in view of the extensive facilities for explosive fabrication which would be required and the time which it would take to get them and to staff the

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laboratory. Clearly, to withdraw strength from Los Alamos for this purpose, to withdraw charges from S-Site, and even the extensive consultation and transfer of information which would be required, would for some time slow down rather than expedite the overall rate of progress in this field.

It is believed to be a fundamental premise in discussions of this nature that to obtain effective and quick aid in the situation, a way would have to be found to transfer activities to other agencies which are already carrying a large share of the burden for Los Alamos. In this way the individuals involved locally in such programs could be released for efforts in connection with programs in which they could immediately become effective. The Los Alamos Scientific Laboratory is currently within a few per cent of the size which it can attain with existing housing at Los Alamos. To build more housing is, of course, possible, but will hardly show an effect upon rate of Laboratory progress within at least two years from the time such a move was agreed upon. (Even this should be much more rapid and effective on a short time scale than a "new Los Alamos".)

Among the activities which seem to us to fall in this class are possibly the following:

(a) Responsibility for all gun type weapon development.

This work is largely carried on for us by the Department of Defense, but the responsibility remains here. It is conceivable that the responsibility could be transferred to the Department of Defense with the Los Alamos Scientific Laboratory retaining only a consultative role and a responsibility for basic theoretical and physical research in the whole field. Such a transfer of responsibility would free perhaps thirty or forty technical men to participate in other programs as well as a considerable amount of shop time. The gun program does not now involve new concepts and even

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It should be clearly understood that, in making this suggestion, the Los Alamos Scientific Laboratory does not wish to imply that it believes that gun type weapons will be more rapidly developed under these circumstances. It is actually our frank opinion that the converse will be true. Nevertheless, we do not feel that the national defense position of the country would seriously suffer, even if the programs were delayed, and the political expediency of such a move may have some merit.

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(b) Responsibility for all nuclear tests.

At the present time, the Los Alamos Scientific Laboratory maintains a complete technical test organization for the conduct of all phases of atomic weapon tests. It would be possible to reduce this organization to a division concerned solely with the experimental measurements of direct interest to the Los Alamos Scientific Laboratory weapon development. The actual test administration and operation would then be carried out by others, and the Los Alamos Scientific Laboratory would merely request an appropriate test operation from time to time when the stage of technical development warranted. Such a decision would release perhaps fifty or sixty people, many of whom would not be suitable for technical work elsewhere and would have to be terminated to make their housing available for additional technical personnel.

It should also be understood that in this case as well, we do not believe that the interest of the Los Alamos Scientific Laboratory will be as well served under such an arrangement as they would under the present circumstances. Nevertheless, it is an activity now largely carried on by other individuals (e.g. 10,000 people at Eniwetok) and might be completely transferred elsewhere.

(c) Responsibility for developing impact resistant implosion weapons.

Such weapons will again involve little new nucleonics but would involve an extensive amount of test and engineering much of which would of necessity have to be carried on by other agencies. By abandoning responsibility in this field (although, of course, retaining full willingness to consult and to carry out such experimental research as the engineering tests may indicate), perhaps development could be speeded - or at least its progress not made the responsibility of Los Alamos.

Such a transfer of responsibility would not free personnel at Los Alamos since none are engaged in this program at present. However, it might give the military a more active sense of participation in weapon development in an area where they are perhaps somewhat qualified.

(d) Responsibility for SF material recovery.

In the course of its research and development work the Laboratory will have a continuing need for the fabrication of active material in various shapes. At the present time the recovery of turnings, crucibles, and miscellaneous waste is a laboratory

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(d) Continued

responsibility intimately connected with the problem of SF accountability. It is conceivable that such materials (particularly U-235) could be bundled up and sent elsewhere for recovery. Inasmuch as this would end a very large amount of related work required for SF accountability (chemical analysis, bookkeeping, etc.), the saving in manpower might be quite appreciable - perhaps equivalent to twenty or thirty individuals. Of course, there would be a considerable loss of SF accountability in detail although the gross balance of material into and out of Los Alamos would eventually be available to the Atomic Energy Commission.

The question is frequently raised as to the reason for Los Alamos concern with processes of active metal preparation, fabrication, and recovery. The answer lies, of course, in the purity of materials required for weapon use. We have accordingly regarded it as one of the primary responsibilities of the Laboratory to make sure that the development of a weapon was paralleled by development of methods to make the material for the weapon. However, once the process is adequately developed (although this is seldom really believed to be the case), our interest in it naturally decreases. Accordingly, the process of U-235 recovery for current weapons is now essentially routine for Los Alamos.

(e) The Laboratory construction program.

For some time we have been conscious of almost active opposition to the Laboratory construction program on the part of the Bureau of the Budget. We have also been aware of a definite lack of confidence on the part of the Atomic Energy Commission itself. At the present time, it is becoming increasingly dubious if structures to be built henceforth will provide as adequately for the Laboratory as those already in existence. The specific proposal can be made to discontinue for the present any further laboratory construction not directly demanded by the needs of the technical program. This would affect specifically buildings such as the Administration Building, the General Laboratory Building, the Medical Research Building, new cryogenics facilities, and others. The construction program, when complicated by the repeated need to justify and rejustify space is taking a serious toll of time of technical people, and the exasperations engendered are no less a detriment to technical work. Were a moratorium to be declared on all further South Mesa construction until either the "war" was over, until the present buildings burned or fell down, or until a somewhat more enthusiastic

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(e) Continued

attitude became apparent on the part of the Atomic Energy Commission, Congress, and the Bureau of the Budget, we could reduce our engineering group by perhaps 20 people, as well as free a comparable number of senior people in the technical divisions from further concern in this matter and permit them to concentrate their energies on the technical program. Additional housing might also be made available at Los Alamos by a corresponding reduction in the local Atomic Energy Commission engineering staff.

This suggestion may actually be made seriously since it is believed that the situation has been continuously deteriorating. Far from increasing morale by an expression of confidence in the permanence and capability of the Laboratory, the present attitudes towards construction are seriously undermining it.

(f) The Laboratory production responsibilities.

It is curious to note that these discussions occur at a time when it has been necessary for the Los Alamos Scientific Laboratory to place S-Site on a production basis for the 7-H program, with the consequent delay in research and development effort in the implosion field. This can, of course, continue to happen if there is inadequate planning in connection with requirements. It is the subject of no little Laboratory bitterness that these criticisms are made of the Los Alamos Scientific Laboratory at precisely the time when it has apparently been a military necessity to take a retrogressive step in Laboratory philosophy and return to the production field.

The completion of APPLE will permit the Laboratory to transfer the major part of its active material engineering design, fabrication, inspection, assembly, and manual writing load. While this cannot be expected to relieve the Laboratory to any great extent for at least a year or more, nevertheless it is a definite step in the right direction and one which will relieve the Laboratory of considerable responsibilities in a routine field. Perhaps some thirty or more individuals (or their housing) can be reassigned in consequence.

With the exception of this last item, the Los Alamos Scientific Laboratory does not believe that the other possible changes are necessarily in the best national interest. However, we recognize the various complications engendered by the current international and Washington situation, and if such changes are directed by the Atomic Energy

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Commission, the Los Alamos Scientific Laboratory will, of course, employ its best efforts to put them into effect promptly and completely.

With regard to specific programmatic matters, the following may be noted: within the next nine to twelve months the major part of the Los Alamos Scientific Laboratory responsibilities with respect to the [redacted] weapon will have been completed. This will complete the geometrical spectrum of implosion weapons according to a long range development program established by the Los Alamos Scientific Laboratory several years ago. [redacted] the forthcoming Laboratory program will reflect no other specific weapon developments in the implosion field other than those cores for which requirements have already been written down. Rather, the Laboratory will embark upon an extensive program of general implosion weapon understanding and improvement which may last for several years. The specific area of maximum concentration will be determined by examining the military stockpile requirements and from the emphasis therein we expect to deduce those weapons which the military regard as most important. If, at any time, it is necessary or desirable for reasons of ordnance engineering or production plant utilization to freeze upon a new model [redacted] of implosion weapon, we will examine the state of the art at the time and design the warhead in accordance with the best concepts which have been tested.

In the thermonuclear field, it is highly improbable that a significant test will be appropriate before May, 1952. It is perhaps most probable that such a test will occur either in the latter part of that year or the early part of the following. The status of this field continues to be one of enormous theoretical interest but whose overall practicality cannot as yet be precisely stated. As noted earlier, it is extremely dubious if extensive administrative changes will do other than slow down this effort. With regard to the ease of staffing additional effort elsewhere than at Los Alamos, it may be noted that Professor John A. Wheeler at Princeton, with essentially carte blanche and the attractions of an academic atmosphere, has been able to obtain the equivalent services of only eight full time theoreticians after an extensive campaign of recruitment involving more than 115 approaches. The tour of duty of many of those whom he did obtain is less than a year. The Los Alamos Scientific Laboratory Theoretical Division now has a staff of 109.

We believe it quite appropriate to examine from time to time both the level of accomplishment and the basic philosophies of the Los Alamos Scientific Laboratory. If we were to criticize ourselves, such criticism would primarily direct itself toward the fact that we have shown too much preoccupation with the development, engineering, and production of specific weapons and correspondingly too little attention

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to the investigation of basic and underlying principles and phenomena involved in all atomic weapons. It is, of course, necessary to point out that this preoccupation has resulted in the more rapid appearance of a given weapon in the stockpile - but at a sacrifice in longer range progress. It is, therefore, our intention, unless specifically directed otherwise, to take every opportunity to increase the fundamental and exploratory aspect of Laboratory operations. Perhaps our greatest hope along this line lies in the rapid completion and activation of Project APPLE; our other lies in the gradual elimination from the Laboratory Program of specific developmental projects paced by military time scales.

Very truly yours,

Original Signed by N. E. Bradbury

N. E. Bradbury
Director

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