To: pSD4@cornell.edu
From: Martin Alexander <ma59@cornell.edu>
Subject:
Cc:
Bcc:
Attached:

I am writing to indicate my enthusiastic support for the Ward Center.

The center has been of immense benefit to our research. Indeed , without its service, much of the research that we have done would not have been performed, would have been considerably delayed and/or become fare more expensive.

For us, the center has permitted the sterilization of soil and other environmental materials with a minimum of disturbance to the physical and chemical properties. Other sterilization techniques (vs. gamma irradiation) would so seriously alter those properties that no meaningful environmental conclusions could be reached.

We have been using the services for many years (more than 10?), and probably 10 or possibly more PhD candidates, postdoctoral investigators and visiting scientists have been involved. In addition, scientists off-campus have asked me about how we sterilized our samples because of the relevance of the gamma-irradiation procedure, and I believe that some of these individuals also made use of the Center' services.

Martin Alexander
L. H. Bailey Prof. of Soil Science Em.

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November 1, 2000

Professor P. Drell
Chair, Local Advisory Council
(Ward Center Review)
118 Newman Laboratory
Campus

Re: Ward Center for Nuclear Sciences

Dear Persis,

I provide, seriatim, commentary on the five considerations identified by Vice-Provost Richardson, as laid out in his charge to your Advisory Council.

1. It is clear that current faculty involvement in the reactor is not as prolific as it has been in the past, but if faculty users across Campus are taken as guide, present involvement is nevertheless important and of high visibility. The record appears to show that a decline in faculty interest occurred under the previous administration and that this is being reversed through the vigorous leadership of the new Director, Professor Ünlü. In this he is clearly fulfilling part of the charge he received from the University.

2. In the area of undergraduate and graduate training, it may not be superfluous to note that we hear nowadays of projected shortages of trained personnel in the power reactor industry. New York State is evidently not well endowed with potential training facilities of the kind represented by the Ward Center. As discussed below it is not inconceivable that public attitudes towards power generation by nuclear means may be changing, and we should perhaps be circumspect and far-sighted when contemplating changes in the status of Ward Center. Though this may carry with it an implication of additional faculty appointments, emerging National and State interests may well warrant this. This particular point possibly merits further study.

3. On the issue of the costs incurred by the University in support of this Center, my understanding here is that the grants currently accruing to the Center, and those presently submitted for funding, will bring in overhead that will soon offset the University annual allocations. The University has made considerable investments in Ward Center over its life and an obvious question is whether current projections on the need for personnel trained in the nuclear sciences should actually be seen more as an argument for recouping these investments. In my view a strong case in this direction can be made.

4. As a service facility it may be noted that neutron activation analysis is a generally valuable technique in the characterization of materials, especially semiconducting materials. Given the thrust currently ongoing in the semiconcductor area at Cornell it would seem apparent that this facility could play a more active role than it has hitherto. On the matter of space the question seems to imply that it could be used for other academic purposes. But it strikes me that here is a case where possession is clearly 9/10 of the law, if not more. All space has some intrinsic value, but it is far from clear to me that space once occupied by a reactor (even one of low power) could be plausibly

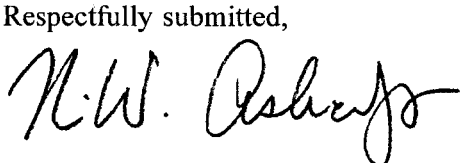
used for other purposes on any time scale considered practical in an academic setting. Imagine the baleful scrutiny it would constantly receive.

5. It would appear that the reactor may require some refurbishing, but overall it is in sound condition. An upgrading through addition of neutron scattering capabilities would be of considerable benefit to on-Campus and off-Campus users for structural determination (both static and dynamic) of materials, and if constituted this way it could well aid in the University's announced major initiative in advanced materials. Though it might involve an increase in the power of the reactor, such an upgrade would be attractive to graduate students (it would provide them with further marketable skills) and could be of benefit to a much wider ambit of users. The costs would be covered by grants, as is common. It is said that the DOE is quite positively disposed towards this notion.

Two general comments: First, the research reactor scene in the US is not a happy one. Most of our reactors are well over 30 years old and the spallation neutron source is not likely to cover the demand for users in all fields of neutron based research. We will need to continue upgrading some of the extant reactors, and perforce we will need a supply of appropriately trained personnel. It seems extraordinary that a large state such as New York is not more of a player in this area, including on the training side. The loss of the Brookhaven reactor clearly does not help matters in our State.

Second, there is a possible political side to this, and it is an area in which I have little competence. But perhaps I might be permitted to recall that years ago there were contentious debates about nuclear power generation, especially on the issue of waste disposal. It was argued by the proponents then, and it appears still true today, that nuclear waste, though repellent to many, can at least be localized. This cannot be said for the mounting volumes of greenhouse atmospheric emissions now being dispersed worldwide through the wanton use of fossil fuels. It is well to keep in mind that we have been brought to this parlous state by a relatively small fraction of the world's population; the remainder have yet to achieve a standard of living, and consequent energy demands, of the minority that is doing the damage. If the growing concerns about global warming continue apace, the shift in thinking about alternative sources of energy (even back to nuclear energy, as we now hear) will affect our thinking on academic training responsibilities for the energy industry. There is clearly a long-haul issue here, and in my view we should be wary about precipitous decisions on a facility that could actually turn out be a future asset. The fact that a window of opportunity for disposal of the fuel rods has opened briefly hardly comes to grips with this more important longer ranged question.

Respectfully submitted,



N.W. Ashcroft
Horace White Professor of Physics

/vec

cc: Professor J. Robert Cooke
Professor Robert C. Richardson
Dr. Kenan Ünlü

Cornell University

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November 17,2000

Prof. Barry Carpenter
Dept. of Chemistry and Chemical Biology
CAMPUS

Dear Barry,

After our conversation on Nov. 15, I was greatly troubled about some of the reasons you gave for the University's perceived need to close Ward Center and to decommission the Triga reactor. I sensed that there are several pieces of crucial information that the Local Advisory Committee needs to have in order to make an informed judgment about the fate of Ward Center. As a former member of the Center's Executive Committee of the Advisory Board, I have had access to most of the correspondence relevant to this question. I have reviewed this information and have solicited and received additional information from the Center's director, Dr. Unlu, which I would like to share with you and the Committee.

The L.A.C. has been charged with weighing the value of the Center to Cornell against the costs of the continuing the operations of the Center and against the costs of eliminating it. During our discussion I hope I conveyed to you how valuable the Center is to my research program, and how our work in the area of Cr-doped- and Cr&Al-doped-forsterite could not have been accomplished without it. I have spoken with and read copies of letters from several colleagues who have expressed strong support for the Center in research and in teaching; I trust the Committee's interviews will confirm this.

In our conversation, you noted that a main reason for deciding whether to continue Ward Center was a "window of opportunity" for shipment of the Triga's fuel--a window that you said came around once every twenty years or so. Have you seen documentation of DOE's position on this matter? From what I can gather, DOE indicated a reasonable likelihood of being able to receive fuel from Cornell starting in 2003 and thereafter. It appears that the Administration is using the contractor's schedule, not DOE's schedule, to generate a pseudo 'window'. This important matter bears close scrutiny.

The area of costs or potential costs to the University needs clarification. You said that the Washington State University was hit with a multi-million dollar repair bill as a result of an inspection for relicensing of its reactor. In fact, the cost was $350,000, and had nothing to do with relicensing. According to the Director, Gerald Tripard, the repair could have been done for $250K in hindsight. Enclosed is a copy of the correspondence from Dr. Tripard and his address if the Committee has other questions about the WSU reactor repairs.

continued

The issue of possible retrofitting of beam ports has been put forward as another potential source of costs. Granted this would be a large cost, but it would be an extraordinary event that could be circumvented without recourse to retrofitting. The Triga has eight ports, and if one were to become inoperable, it could simply be closed off, and another used in its place. If the Committee has questions about this potential problem, I suggest that you contact Dr. Kenan Unlu, who is a well-respected expert in the area of port design and operation. In addition you should consult any of the directors of the research reactors at peer institutions, several of whom have sent letters to Prof. Drell in support of the Ward Center. Have you seen these letters? In case you have not, I have enclosed copies of the letters from Dr. John Lee at the Univ. of Michigan, Dr. John Bernard at M.I.T., Prof. Michael Corradini (U. Wisconsin-Madison) and others. One of the latter is from Dr. Pedro Pérez of TRTR, the National Organization of Test, Research, and Training Reactors. Dr. Pérez could provide the names of additional experts to comment on this and other technical issues.

The relicensing of the Triga reactor (not 'recommissioning' as has been described in the charge to the Committee) is expected to be a straightforward process, and will cost no more than $90K. Details of this process were described to the Ward Center Advisory Board in June, and are contained in a letter from Dr. Unlu to V. Provost Richardson, dated September 20, 2000. In this letter (copy enclosed) Dr. Unlu states "I would like to reiterate that the relining of the reactor pool and the retrofitting of the beam ports are neither required nor needed for relicensing." Attachments to that letter also include a description of the non-power reactor relicensing process from an ANS meeting session chaired by Dr. Pérez in June, 1998. Additional information regarding relicensing of the Cornell Triga reactor may be obtained from Alexander Adams at the Nuclear Regulatory Commission (axa@nrc.gov).

I cannot stress strongly enough that it is crucial for the Committee to have a balanced picture of the important technical issues involved in its decision, and to have the opinions of experts other than Mr. Aderhold and Prof. Kostroun. I suggest that you or the Committee chair solicit these opinions independently of the Administration.

In our discussions, you mentioned that the decommissioning of the Triga reactor would cost around $2M. I don't know where this figure came from, but it grossly understates the real cost. As recently as April of this year, Cornell filed a report, 10 CFR 50.75 (d), with the NRC (copy enclosed) that estimates the cost of decommissioning at $4.01M. That report is based on a confidential study carried out for the University of Illinois by GTS Duratek. At my request, Dr. Unlu has obtained permission to duplicate the executive summary of the GTS Duratek report (copy enclosed). This report estimates the cost of decommissioning the U. of Ill. 1.5 megawatt Triga reactor at $4.4M. The $4.01M estimate for Cornell was made by Dr. Unlu by considering the lower power of Cornell's reactor, and the costs associated with the gamma cell deactivation. Georgia Tech. recently decommissioned its reactor; the price tag was $6.7M (not including fuel removal and

continued

demolishing the building)! Additional information about their experience may be obtained from Prof. Nolan Hertel at Georgia Tech. (nolan.hertel@me.gatech.edu).

Another concern of the Administration is the ongoing costs of the Center. As you know, most of these costs are offset by fees paid by outside users. Most of these users, described in Appendix C of the Center's report dated September 2000, are companies in the State of New York. What is not shown in the Appendix are the many expressions of gratitude for the services of Ward Center that were sent to Prof. Drell from these companies. In case you have not seen them, I have enclosed six letters from such prestigious companies as Kodak, Corning, and Westinghouse. It is clear that the Center is performing valuable outreach services to these in-state companies. If the University is to pay more than lip service to it's outreach and service mission, it must seriously consider the value of these mutually beneficial relationships.

About the time the Center was founded, the College of Engineering put up $200K/yr. for three years for partial support. The expectation was that in subsequent years the other Colleges would contribute. I do not believe this has happened. As we discussed on Wednesday, the research activities of the Center have increased substantially (see WCNS Report, p 14), and the overhead from the grants alone would cover this 'allotment', providing a fair fraction of those funds were returned to the Center. The present policy of 10% return to the Center is ridiculous given the overall value of those grants to the University, it's staff and students. How should the University value the services of the Center to the research projects that are charged little or nothing? My research program, described above, was largely supported by MSC, which did not pay one cent for the many essential neutron activation analyses that my graduate student, Jennifer Mass, carried out at Ward Lab. Five publications resulted from that work. She was trained, the work was done in a timely way, and she, MSC, and the University benefitted. Should MSC have been charged? Maybe, but it was not.

Another source of additional support for the Center is the Department of Energy. In a letter to Prof. Drell, dated Nov. 1, 2000, William Magwood IV, the Director of the Office of Nuclear Energy, Science and Technology at DOE strongly advocated continuation of Ward Center. In case that you have you not seen this letter, I have enclosed a copy. He notes that funds specifically earmarked for support of university research reactors have increased fourfold ($3M to $12M) in the past three years. The Ward Center is eligible for additional bridging funding (above and beyond the $620K received from DOE in 2000-2001). Cornell's eligibility for additional funding for reactor operating expenses is discussed in Prof. Michael Corradini's letter (U. Wisconsin-Madison) to Prof. Drell. If Prof. Drell has not shared this information with the Committee, I hope that you will.

continued

In summary, the risks and the costs of continuation of Ward Center are small in comparison to the benefits to Cornell University in the areas of research, teaching, and service. I urge you to educate the members of the Local Advisory Committee on the facts of the case. When these facts are on the table, free of smoke from the Administration and its 'consultants', the choice will be obvious: Preserve Ward Center. Nurture it. Make it the model Center that it is well on it's way to becoming already.

Sincerely,

James M. Burlitch
Professor

encl. 7 documents

cc. Prof. Robert Kay
Dr. Kenan Unlu

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Professor Persis Drell, Chairperson
Local Advisory Council
118 Newman Laboratory
Cornell University

2 November 2000

Dear Professor Drell;

As a senior faculty member, I wish to recommend that the University enthusiastically support the future work of its unique and valuable Ward Center for Nuclear Sciences.

History. The Ward Laboratory was founded by Professor David D. Clark, and went into operation in 1961. The laboratory was built and equipped by the National Science Foundation, the Atomic Energy Commission, and the Vitro Corporation headed by a benefactor, J. Carlton Ward Jr. University funds were not required. Mr. Ward endowed a permanent chair, the J C Ward Jr. Professor of Nuclear Energy Engineering, held by Professor Hammer. In addition, Mr. Ward gave the university 1M$ in lieu of operating expenses for the laboratory. This money was designated as the College of Engineering master plan and was largely used at the time of the planning of Rhodes Hall and other engineering buildings. The research at Cornell in nuclear science and engineering has been successful and graduates include CEO's of major and minor corporations and professors at important universities. Currently we have six graduates who are professors: two at Ben Gurion University, and one each at the University of Toronto, Southern University, University of California at Berkeley, and MIT.

Vision. In 1995, we took steps to recognize the breadth of the use of the Ward Laboratory for researchers and teachers outside of our department: faculty members from soils, veterinary medicine, archeology, art, materials, textiles, physics, etc. A committee composed of Prof. Holcomb (physics), Prof. Burlitch (chemistry), and Prof. Kay (geological sciences), studied the uses and potential uses of the Ward Laboratory as a university center freely open to all departments and colleges of the University. Their vision was to convert the Laboratory to a Center that would provide the breadth of radiation services of the laboratory to faculty and staff without charge, and to promote research contracts from across the university by cooperating in joint proposals, building equipment facilities, and providing teaching and research services to all members of the university community. In their vision, the Center would continue to provide irradiation services to nearby corporations in order to support the center financially and to support the University's Land Grant mission. Vice President Scott carefully thought out the structure for the Center and its advisory and executive committees. The Center became a reality in December 1996 when the University Senate recommended to the Board of Trustees the establishment of the Ward Center for Nuclear Sciences. The very successful period of the last four years has, in my opinion, borne out the wisdom of the Kay, Holcomb, Burlitch, Scott vision.

The Director. As part of the implementation of the vision of the Ward Center, we hired a director, Prof. Ünlü, who came from the University of Texas on July 1, 1998. The choice of Professor Ünlü was made by Vice President Scott upon his personal assessment and upon the recommendation of a formal search committee [McGuire (nuclear science and engineering), Burlitch (chemistry), Kay (geological sciences), Kallfeltz (veterinary medicine), Dubovi (veterinary medicine) and Coleman (classics)]. Professor Ünlü was chosen because of his proven record of building and operating

experimental facilities at reactors and for his organizational and promotional skills that could be applied to directing a multi-purpose Center. Professor Ünlü's report on the Center's work since 1998 forms a clear and compelling argument for the University's support of its Center.

University Commitment. The Center has enjoyed strong University administration support since its founding in 1996. However, the support was suddenly withdrawn on June 12, 2000, when the University announced to the Department of Energy that the Ward Center was being shut down. This decision was made in secret and without consultation with any user of the Ward Center. We strongly hope that this decision can be overturned and the benefits of the Ward Center and its pioneering vision can by properly recognized by the University administration. In my opinion, it is necessary that the University make a substantial intellectual commitment to the future of the Ward Center. However, it is not necessary that the University make a substantial financial commitment to the Center. Currently, the University supports the Center at about 200k$/year out of a Center budget of about 500k$/ year. For the 200k$/ year the Center pays some graduate student tuitions, provides full support of a senior faculty member, provides research services worth more than 200k$/year to academic departments, and supports teaching in university classes for several hundred students per year. Professor Ünlü has been successful in promoting an important policy change at the Department of Energy. The DOE is now planning to provide university reactors with operating funds.

Extension of TRIGA License. The TRIGA Reactor license is due to be extended for up to 20 years in 2003, and the Center needs the cooperation of the University administration for this extension. The TRIGA facilities and controls have been kept up to date and will not need to be modified for the relicensing. The effort of relicensing is in a formal application document and will be handled by the laboratory staff. There is no concept of "recommissioning", an incorrect and pejorative word used in the charge to the LAC committee.

Disinformation. There appears to me to be some incorrect information surrounding the Ward Center and the administration's decision to close it. I am familiar with the persons, the motivations, and the actions surrounding some of this, and would be willing to discuss these things with the committee if necessary. I do not personally think it a good idea, but strongly believe we should all obey a kind of academic Golden Rule. I ask that the LAC Committee call on all parties for careful attention to the facts when dealing with this issue.

Recommendation. Whereas the Ward Center is successfully fulfilling its faculty mandated mission, **whereas** it represents a unique and successful model of the way laboratories, like libraries, should organize for the common good of a university, and **whereas** the teaching, research, and service benefits far outweigh the costs, I **recommend** without reservation that the University support the model and the future work of the Ward Center for Nuclear Sciences.

Sincerely,

K B Cady

K. B. Cady, Professor
Theoretical and Applied Mechanics

cc: Professor Robert C. Richardson, Vice Provost for Research
529 Clark Hall, Cornell University

Professor J. Robert Cooke, Dean of the Faculty
315 Day Hall, Cornell University

Professor Kenan Ünlü, Director
Ward Center for Nuclear Sciences, Cornell University

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October 6, 2000

Prof. Persis Drell
Chair, Local Advisory Council
118 Newman Laboratory
Campus

Dear Persis:

I write in connection with the review of the Ward Center for Nuclear Studies.

My main use of the reactor has been as a teaching facility for Physics 208, the introductory physics course taken by many premeds and biology majors. Starting in 1994, and every year since then, we have incorporated a tour of the reactor and performance of a neutron-activation analysis experiment there as the laboratory portion for the unit on nuclear physics. The roughly 200 students in the course divide up in 10-student groups, each of which spends an hour at the reactor with their own section instructor, with some assistance from the reactor staff. Each group runs one prompt and one delayed gamma spectrum on a freshly-activated sample, then takes a copy of the print-out home to analyze.

This lab experience has been one of the high points of the course. Students are very interested to see the inside of the reactor, and their imagination is piqued by possible applications of the neutron-activation technique.

The reactor staff have been most generous with their time and help before and during the week when all this takes place. They have not only given us access, but also run the reactor through the neutron-activation cycle with each group. A key part of the process in recent years has been a training session which they have held for all the regular instructors in the course to prepare them as tour guides and equipment operators.

My only other contact was when I was Physics Dept. chairman recently. The jointly-offered course, "Art, Archaeology and Analysis", led to lively discussions among the several instructors about the possibilities and merits of various methods of trace analysis. I think these discussions may have been part of the impetus for the new program using neutron-activation analysis to look at absolutely-dated tree-ring samples.

I think it is a good thing that Cornell has a reactor and can do this!

Sincerely,

DBF

Douglas B. Fitchen

cc: J. R. Cooke; R. C. Richardson; K. Unlu

CORNELL
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School of Electrical and Computer Engineering

Frank H. T. Rhodes Hall
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November 6, 2000

Professor Persis Drell, Chair
Local Advisory Council
118 Newman Laboratory
Cornell Main Campus

Dear Persis:

Thank you for the opportunity to meet and talk with you and Professors Burns and Buhrman about a month ago regarding the value of the Ward Center for Nuclear Sciences to the University now and in the future.

I am sure that it was clear to all of you at that meeting that I am firmly in favor of Cornell's continuing to keep the Ward Center, and especially the TRIGA reactor, as a fully operational University facility for several reasons. These include the rapidly growing list of faculty and graduate student users from all over the campus for research, the existing and potential contributions it makes and can make to undergraduate teaching programs, and the substantial and growing use of the facility by corporations, including several New York State corporations. These points have been documented for you by Ward Center Director, Professor Kenan Unlu already. In addition, I believe that the growing shortage of engineering graduates with training in nuclear science and engineering (NS&E) will lead to a resurgence in interest on the part of undergraduates, especially if the United States rediscovers the benefits of nuclear power in a world struggling to reduce CO_2 emissions. (However, the Cornell administration will have to stop declaring NS&E at Cornell to be dead if we are to expect students to be willing to come here, or stay here, as graduate students in NS&E.) Finally, it is worth noting that outsiders view the present Ward Center facilities, the cold neutron source, for example, and the research in progress there on the time-of-flight method for neutron depth profiling, as unique and important. This was something on which I couldn't comment at our meeting, but which I have recently learned from the letters that have come to Professor Unlu in support of the Ward Center from outside experts in the field of NS&E.

Overall, with all relevant indicators of the vitality, institutional value and viability of the Ward Center moving upward at an increasing rate, it seems to me now is the time for the administration to be strongly supporting the Center instead of being on the brink of a decision to eliminate it. Certainly, the contemplation of such a decision cannot be because of mismanagement by the Director since it appears to me that Professor Unlu has done exactly what he was hired to do by Norm Scott in his role as Vice President for Research. Therefore, it has occurred to me that two issues that were brought up by Professor Buhrman in our meeting a month ago must be receiving a lot of attention: the number of students in the graduate field of Nuclear Science and Engineering and the safety of the facility. As I was unprepared to discuss those issues in any detail at that meeting, I think it is important that I do so here. The easy one to address is safety, so I shall do that first.

It was Professor Buhrman's belief that the reactor control systems and instrumentation were 1960's vintage, or if not that old, then at least not modern. I have learned that this is not the

case - - the control systems and instrumentation have all been upgraded and modernized. The electronics in the control room is all less than 10 years old. Some of it was installed as recently as last year. Secondly, it was correctly pointed out that Professor Unlu is not a certified reactor operator. However, he was hired to provide scientific and managerial leadership for the Ward Center, and safe operation is assured by the professional staff led by the reactor supervisor. Please remember that a nuclear reactor and its staff are certified by the Nuclear Regulatory Commission, and safety is the issue on which its inspectors base their certification. Professor Unlu, as the facility Director, contributes to that certification through his ability to manage the facility. The Director of the Materials Science Center (MSC) does not have to know how to operate all of the pieces of equipment in his center that utilize toxic chemicals for the laboratories in MSC to be operated safely. Likewise, it is not necessary for the Director of the Ward Center to be a reactor operator for the reactor facility to be completely safe.

Regarding the number of NS&E graduate students, I believe that Cornell students from Physics, Applied Physics and the various engineering disciplines will begin to come into the field as MEng students again if the Vice Provost for Research makes a positive statement about the future of the Ward Center as a result of the present review. At the present time, students are discouraged from joining the graduate field because "the word" is that the university is going to eliminate the program. Professor Unlu has two new MS/Ph.D. students and research funds for two more. These students will provide in "in house" group which, together with all of the student users from other departments, will encourage additional students to enter the program both as MEng students and as MS/Ph.D. students. They need just a little bit of encouragement from the administration that the Ward Center will continue to be there for them.

In summary, it seems to me that the Ward Center and the TRIGA reactor that is its centerpiece are presently valuable assets for the University and the surrounding area, and their value is rapidly growing. Furthermore, with the DOE programs for support of nuclear science and engineering programs and research reactors at universities also rapidly growing in response to a critical shortage of appropriately trained engineers, it is unlikely that the Center will require an increased investment by the University to keep it in operation. In fact, it could well be that the University's subsidy could substantially decrease in the near future. Therefore, I believe that the long term interests of the University, as well as the State of New York and the country are best served by maintaining the Ward Center for Nuclear Sciences as a University facility. I urge you and the LAC to give the Ward Center a strong vote of confidence in your recommendation to Vice Provost Richardson.

Thank you very much for your consideration.

Yours truly,

David Hammer

David Hammer
J. Carlton Ward Professor of
Nuclear Energy Engineering
Professor, Electrical and Computer
Engineering

Xc: Professor Robert C. Richardson, Vice Provost for Research
Professor J. Robert Cook, Dean of the Faculty

CORNELL
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College of Veterinary Medicine Ithaca, New York 14853-6401

November 17, 2000

Dr. Persis Drell, Professor of Physics
Chair, Local Advisory Committee to the Vice Provost for Research
118 Newman Laboratory
Cornell University
CAMPUS

Dear Professor Drell:

As the Chair of the University Radiation Safety Committee and the James Law Professor of Nutrition in the College of Veterinary Medicine, I am writing to express my very strong support for the preservation of the TRIGA Mark II research reactor and the Ward Center for Nuclear Sciences of the University. Late in the summer I was provided a copy of the letter of June 12, 2000 from Vice Provost Richardson to Mr. Peter Dirkmaat of the Department of Energy. The Vice Provost expressed his concerns for the viability of the TRIGA reactor and requested information on the early removal of the reactor fuel. The two major reasons given for this initiative were that the academic program centered on the Cornell TRIGA reactor was lower than can be justified for such a facility and that the space occupied by the Ward Center was needed for other research purposes. Vice Provost Richardson also alluded to the age of the reactor and suggested that major modifications and upgrades might be necessary. More recently Professor James Thorp advised me that the Local Advisory Committee has been informed that a "window of opportunity" exists for decommissioning the reactor at a greatly reduced cost if it is done at the time of the need for re-licensing in 2003.

I have also been provided with a copy of the September 2000 report of the Ward Center for Nuclear Sciences as well as copies of letters from several individuals in the Department of Energy, various commercial users of the WCNS as well as from several members of the University faculty regarding their need for the facilities available in the WCNS for both research and teaching purposes.

While academic interest in the WCNS did appear to wane somewhat during the last 10 to 15 years, I have been most impressed with the initiatives undertaken by Professor Unlu since his appointment as Director of the WCNS and the significant increase in the utilization of the facility for both research and teaching purposes occurring in the last two years. The amount of funding provided to the WCNS by the University is indeed very small considering the current value of such a facility. Further, from a review of the WCNS report, it seems clear to me that the WCNS is essentially financially independent and that the need for this small contribution from the University will most likely disappear within the next year or two. I was very impressed by the list of courses that are currently making use of the WCNS for instructional purposes as well as the number and diversity of faculty using the WCNS for research.

It is most difficult for me to comment on the criticality of the space needs of the College of Engineering. However, the unique construction of the WCNS building would limit its general utilizability, although it might provide adequate space for specific purposes. From environmental as well as other perspectives, it appears to me that it would be most unlikely that the Ward Center building could be razed and the space used for new construction.

With respect to safety, as you know the University Radiation Safety Committee is responsible for the safe handling and use of all radioactive materials and ionizing radiation producing devices of the university. The committee meets at least 4 times annually to review all aspects of the safety programs in place in the university, including those at the WCNS. I am absolutely confident that there are no current safety issues with respect to the TRIGA reactor. If there were such problems, the radiation safety committee would be very aware of them and involved in taking the necessary steps for correction.

After receiving a copy of the letter from Vice Provost Richardson to Mr. Dirkmaat, I wrote to Professor Richardson expressing my concerns regarding the possible decommissioning of the TRIGA reactor and my strong support for its continuation. Professor Richardson responded that his letter to the DOE was a request that Cornell be considered for early removal of fuel from the reactor and that, should this be a possibility, there would be extensive discussions regarding such an action before a final decision was made. The aforementioned "window of opportunity" made known to me by Professor Thorp suggests that a positive response was received from the Department of Energy which indicated that the cost for decommissioning would be much lower if it occurred within this "window". Hopefully the LAC will carefully review the financial and other implications of the DOE response.

The WCNS has been a very valuable Cornell resource for many decades and has provided teaching, learning, and research opportunities for a very large number of students and faculty of our university as well as from other academic institutions during that time. Several faculty of the College of Veterinary Medicine, including myself, have made use of the reactor over the years for studies of the effects of neutron and gamma radiation on biological systems, the manufacturer of short lived isotopes for use in biochemical and physiological research activities, for radiation sterilization of various biologic agents and for other purposes. And, as mentioned previously, there are many other faculty throughout the university who use these facilities for both teaching and research purposes.

As you may already be aware the College of Veterinary Medicine has recently initiated a major new program in Comparative Oncology. The Director of this program, Dr. Rodney Page, and I are currently working with Professor Unlu and the WCNS toward the development of boron neutron capture therapy of central nervous system tumors, a treatment modality currently under development at only a few sites throughout the world. This procedure requires a source of thermal and epithermal neutrons and the TRIGA reactor is perhaps the most ideal source of such radiation. We are looking forward to collaborating with the WCNS in this venture.

In my view the current director, Professor Kenan Unlu, has done an outstanding job during his short tenure in renewing interest in and the vitality of the WCNS. For example, research funding has increased from only $30,000 in 1998-99 to over $600,000 for the current academic year, with a further $971,000 of research support pending. I believe that the Ward Center for Nuclear Sciences has a very bright future. As the only research reactor in New York State and one of only 26 in the continental United States, it represents a most unique facility serving a large number of constituents at Cornell, in New York State and elsewhere. In my view it will continue to serve a vital need well into the future.

I wish the Local Advisory Committee wisdom, inspiration, and sound judgment in their advisory capacity to the Vice Provost for Research on this critical issue. If I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Francis A. Kallfelz

Francis A. Kallfelz, DVM, PhD
James Law Professor of Medicine (Nutrition)
Chair, University Radiation Safety Committee

Cc: Professor K. Unlu
Professor K.B. Cady
Vice Provost R. Richardson
Professor J. Thorp
Dean J. Robert Cooke
Professor Rodney L. Page

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October 16, 2000

Professor Persis Drell
Chair, Local Advisory Council
118 Newman Laboratory
Cornell University
Ithaca, NY 14853
Dear Persis,

This is a response to the October 3 letter from Dr. Ünlü concerning the review of the Ward Center by the Local Advisory Council.

Although I know quite a bit about the Ward Center, and am good friends with several of the people there, I am not a major user of the Center, so my comments and opinions should be considered in that light. I did collaborate with Prof. Steve McGuire on one project involving delayed gamma trace element analysis.

I see the Center as having an unrealized potential in two major areas of current or potential interest to Cornell: materials science and nuclear power engineering. However, achieving this potential cannot be addressed without a substantial increase in funding, a difficult task which demands more aggressive management.

Without this increase, the future is very much in doubt. Others can defend the very real contributions the Center is already making to teaching and research better than I can. I expect you will receive letters making this case. The report I received covers these activities thoroughly. But I feel that more can and must be done if the Center is to remain viable in the long run.

The two areas of future interest I refer to are:

1) Materials Science: This area represents a major and growing research commitment by Cornell. Can the Ward Lab contribute to materials research at Cornell? With the closing of the Brookhaven reactor, there is no source of neutrons available in NY State of which I am aware. Some of the activities at the BNL reactor, which had a very high flux, might be pursued at Cornell, despite the lower flux here. Inelastic and elastic neutron diffraction for materials analysis is a major tool in solid state physics. The Center needs to consult with Frank DiSalvo and others to explore where the local reactor could contribute. Could a useful polarized beam of thermal neutrons be developed for understanding the magnetic properties of materials? Neutron diffraction might be worth a major investment once specific applications have been identified. There has been valuable

work on delayed gamma rays for trace element analysis, but this has not been used by others as much as it could be because there is no facility for this. It could be like the CCMR x-ray lab in Snee Hall, which has a steady stream of users. There are technical issues, which need to be weighed carefully, but the coupling to the rest of the Cornell materials research community must become much stronger and more imaginative. Having a local neutron facility for materials research could be a great asset to Cornell.

2) Nuclear Power: The present trend (more like a stampede) away from nuclear power in the US (but not in France) is a colossal mistake. This mistake is one that Cornell has recently participated in very enthusiastically, I must say. It certainly lacks the vision thing"! Now that the cost of oil, natural gas and electric power are all rising rapidly, we should definitely reconsider our negative position on nuclear engineering. The Ward Center can be the nucleus (no pun intended!). One member of the Center, Prof. Bing Cady, is developing a simulation program of potentially world-wide interest. He could, perhaps, expand this operation, and use the local reactor to test it. Having a local reactor might be a considerable asset to this program, which is a collaboration with the French. Prof. Cady does see clearly that ultimately we will return to fission power as a major source of energy. I am fully aware of the disastrous engineering and safety failures in the US and Russia, but think that these are not intrinsic, and can be solved, with French help. Cornell could and should play a leadership role, fulfilling Hans Bethe's original vision that coal and nuclear energy will be the prime sources of energy in the US in the longer run. The question is: is Cornell going to be part of the solution, or part of the problem? This will take leadership, not only of the Ward Center, but also from the Vice-President's Office if it is to attain a critical level of effort.

One new development is the possible availability of state funds. For the first time, CCMR has managed to obtain funds from NY State. Certainly, Ward Lab should explore this possibility in detail. We should look at models from other states which support similar university reactor centers, like Texas, for example.

Ward Lab is in a very defensive position right now. This needs to be changed, or else the Center should be closed and the space made available for some other purpose.

I recommend that an Advisory Board be created with a membership both internal and external to Cornell. Dr. Ünlü and Prof. Cady should be members. The Board should be charged with recommending specific and realistic steps to achieve the goal of modernizing the Center. This is to be achieved within the next two years.

Sincerely,

Lou Hand

Lou Hand
Professor of Physics

cc: Prof. J.Robert Cooke, Prof. Robert C. Richardson, and Dr. Kenan Ünlü

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Prof. Persis Drell
Chair, Local Advisory Council
118 Newman Laboratory
CAMPUS

7 November 2000

Dear Persis:

When I wrote the attached letter to Bob Richardson last June shortly before I left the country for a summer's fieldwork, I thought Kenan had everything at the Ward Center under control. When I heard that you had undertaken a review of the Center, along with your LAC, I also figured out that the Cornell faculty was actually having some input into what goes on on campus.

You know what has gone on from my end. The NSF proposal (of which you have a copy) is in, and one of our visitors to the lab last week (Prof. Jon Pilcher of Queen's University Belfast) was one of the reviewers. When he offered me wood from the Irish 7272-year-long chronology, I figured he must have written a positive review. Today Amanda Erwin took over the first four-century-long piece of wood from my lab, and on Thursday she and Michael West will beginning cutting it up into one-year-long segments. Both Amanda and Michael have finished the radiation safety course at Ward. Another damsel is taking it.

I am dismayed after all this to hear that apparently Day Hall is not playing entirely above-board (by Day Hall I mean Messrs. Richardson, Lowe, and Silcox). They seem to have hired yet another "consultant" for a mere $23,000 to look into the feasibility of shipping fuel rods. Even if your committee decides to make a positive recommendation to the faculty, and even if the DOE comes through with major new funds, and even if I and others get our NSF grants, does all this mean that the Gang of Three is going to have its way after all?

What is particularly bothersome is that Bob Richardson and associates do not seem to be dealing with Kenan in a straightforward manner. If they had said at the outset that they were planning to shut him down no matter what happened, that would have been one thing, but it seems to me that they are wasting Kenan's time, and my time, and your time by going through what appears to be a charade in which it is pretended that all procedures will be followed scrupulously.

Surely, the hiring of first the disgruntled Mr. Aderholt and now this new fuel-expediting firm on the same old grounds that "options must be kept open" does not sound like good management practice. I <u>like</u> all the people in Day Hall, but now I am beginning to mistrust them. Do you trust them?

The faculty, if confronted with another top-down example of management, are going to raise hell. Are the President, Provost, and Vice-Provosts prepared to deal with this?

With kind regard,

Peter Ian Kuniholm
Professor of the
History of Art and Archaeology

copies: Prof. Robert Richardson
Prof. J. Robert Cooke
✓ Dr. Kenan Ünlü

Cornell University

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I am meeting with the LAC to report on information relevant to its reaching a recommendation on the recommissioning of the TRIGA reactor, the centerpiece of Ward Laboratory. In effect, this recommendation is also a recommendation on the continuation of the Ward Center and the Nuclear Sciences Graduate program. My relationship with the Laboratory continues to be as a user. Over the past two decades, the number of INAA rock analyses published by me and by others in Geological Sciences exceeds that of any other university laboratory except possibly that of Frey at MIT. My relationship with the Center is as the Chair of its Advisory Board. With Professors Burlitch and Holcomb, I co-authored the report that was the basis for the creation of the Center by the Trustees in 1997.

This past summer, I have furnished to Vice-Provost Richardson 15 of our papers in top international journals (Journal of Geophysical Research, Geochimica et Cosmochimica Acta etc.); all contain INAA data representing some of the approximately 4000 rock analyses done at Ward Laboratory over the past 2 decades. The papers are chosen to highlight international collaboration as well as work by Cornell undergraduate and graduate students. The scientific impact of these papers is very high, as judged by the large number of citations in Science Citation Index. One of these papers (1993, Tectonophysics) has been the second-most cited article in that journal for that year. To this meeting, I bring a 16th, a 1999 summary paper that is as good as any in indicating the scope of the INAA analytical program.

Were the TRIGA reactor to be decommissioned, it is fair to say that one of the top INAA analytical facilities in the country would be lost as well.

Robert Kay
Geological Sciences
November 7, 2000