Letters

International Scientific Exchange: Additional Views

I write in response to the letter to William D. Carey on scientific exchanges with the Soviet Union from Frank Carlucci, Deputy Secretary of Defense (8 Jan., p. 140), with specific reference to Talis Bachmann (not Bachman). Talis is a young faculty member at Tartu State University in the Estonian S.S.R. who spent the 1980–1981 academic year with me at Vanderbilt University under the International Research and Exchange Board program. Along with other colleagues who had contact with Talis, I was very surprised to find his name mentioned in Carlucci's letter.

Carlucci indirectly suggests that Bachmann was a "senior, experienced, technical" researcher. Talis was 29 when he arrived in the United States. He had received a *Kandidat* degree in psychology in 1977 and since then has been an assistant professor at Tartu State University. The *Kandidat* degree is comparable to the Ph.D. degree in the United States, but it is usually based on 3 years of graduate work and thus actually falls between the M.A. and Ph.D. degrees. Talis' graduate thesis and publications have been concerned with traditional basic aspects of visual information processing, such as selective attention, masking, and subjective contours. Academic research on these topics has seldom been associated with specific technological applications, military or otherwise. Talis did not suggest any knowledge of or interests in particular technological applications of this research in his discussions with me or in his publications.

Carlucci states that Bachmann "came to study the interface between man and machine." This is a more general and technical characterization of his activities than I had previously seen. Talis' stated aim was "to investigate selectivity of visual perception by combined psychophysical and information-processing methods" using an "automatized system" such as a laboratory computer for controlling visual displays—a valid characterization of his research interests. He was concerned with visual pattern perception rather than man/machine systems as such.

Carlucci states that "In the opinion of U.S. researchers, this field was directly applicable to the design of heads-up displays. . . . " Research on visual masking and attention is no more directly related to heads-up displays than are ordinary television advertisements or video games. The theoretical issues and the design of experiments in this area have seldom been explicitly concerned with the design of "displays which optimize the amount of data presented" to any observer, let alone to a "military weapon system operator," as Carlucci indicates.

Carlucci states that Bachmann "was able to observe state of the art demonstrations of such work funded by the Department of Defense." When I mentioned this statement to two researchers whose work is probably referred to here, neither initially recognized that the reference was to his work. Both projects were unclassified and supported by the category of research grants in which publication is encouraged. Although Talis did observe some visual displays used in these projects, he did not inquire about the techniques used in generating the displays or about potential applications of the research.

Carlucci states that "Bachman attended several very significant conferences on this topic. . . . " The two conferences Talis attended were concerned with general research in contemporary experimental psychology. None of the reported research was classified or had any readily obvious military applications. I am not aware of any particular research supported by the Department of Defense, although a small portion of the work probably was. It is difficult to imagine that Talis obtained any significant information directly related to military technology from either conference.

Talis Bachmann was a delightful and stimulating visitor. Any interests he may have had in obtaining information applicable to military technology were surely not obvious. We learned much from him about Soviet psychology, and we hope that he learned from us about American science and society in general, as well as about visual perception in particular.

Carlucci's description and interpretation of Bachmann's activities suggest some of the potential dangers in applying a narrow military perspective to controlling the flow of scientific information. From such a perspective, almost *any* information about human perception can be seen as militarily significant. Military technology is only one of many potential applications of scientific information. The possibility of military application is not a sufficient criterion for restricting that information. If the Soviet system has difficulty translating scientific research into technology, perhaps part of it is related to their restrictions on access to scientific information.

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I have just learned from the exchange of letters between William D. Carey and Frank Carlucci that Carlucci uses my name to support his view on the need to erect an iron curtain around the science of an "open and free society." He appears to admit the need for some holes in the curtain for "legitimate scientific discourse" but seems to reserve the right to question the legitimacy of any discourse in retrospect and to make offensive statements about individuals he chooses for this purpose—as he does in my case. In view of his mentioning me, may I contribute to the additional views Carlucci calls for in his reply.

Just as many others in the field of academic research, I believe that the unrestricted exchange of ideas is an important, driving force in the advancement of scientific progress. For my part, I have a research group in Hungary which is open to anyone interested in contributing to a better understanding of the physics and applications of magnetic domains, including scientists from the United States and from the U.S.S.R.

In 1973 I elaborated a proposal on the application of high-speed photography in the study of magnetic domains of materials commonly known as "bubble" garnets. At about the same time a similar idea surfaced at Caltech. Through our combined effort an instrument was constructed at Caltech and later a similar one in Budapest; both proved to be valuable for bubble research. My contribution was given appropriate credit in the literature and in the proposal for a joint U.S.–Hungarian research project submitted to the National Science Foundation (NSF) and to the Hungarian authorities. The proposal, accepted and (for the U.S. part) funded by the NSF under grant No. INT 76-02666, clearly states that the joint venture has nothing to do with device applications. The statement relating to device applications was made because it was felt that commercial com-

panies may wish to produce and sell devices, and we specifically wanted to stay away from any information that might later prove to be proprietary. Nothing that I have ever come across in the bubble field was classified. Numerous papers have been published on the dynamic instabilities of magnetic bubbles and bubble walls based on the research done jointly using U.S. and Hungarian samples and equipment. The proposal for continuing this work was rejected by the NSF without offering the Hungarian partner any reason.

Contrary to what Carlucci says, the scientific knowledge I gained in the United States was *not* on bubble memories. All of my visits concentrated on domain physics and involved a seminar and a discussion on our work in Budapest and at Caltech. Carlucci makes no mention that this is the kind of scientific knowledge I could possibly pass on. He also fails to mention that my way of providing information to every scientist in the world, including the "Soviets," was to publish in international journals. Further, he does not mention that through the very same channel I also provided information gained in my own laboratory and that scientists of many nationalities, including ones from the United States and from the U.S.S.R., with whom I published did the same thing with the information they gained during their stay in Hungary. What Carlucci states about my role is taken out of proper context and is meaningless and offensive.

In the 1970's the "big deal" in magnetics was the bubble. Everybody was interested, and everybody including the U.S.S.R. wanted to find out what it could be used for. Scientists traveled back and forth. In fact, I cannot specify a single place I visited in the United States that would not have received Soviet colleagues. I might add that quite a few Americans were welcomed in Budapest and in Moscow. Many of these visits resulted in coauthored papers. A series of international conferences was launched by IBM; the four International Conferences on Magnetic Bubbles held so far have provided open forums to exchange ideas. I am proud to be a member of the organizing committee of these conferences. It is natural that we also conducted studies with Soviet scientists, and these included research on the practical applicability of magnetic bubbles and involved common construction and study of chips with certain potential in memory application. There was no secret about it; it is well known to the magnetics community not only through the frequent exchange of visits mentioned but also by its coverage in the scientific and public press. Nobody ever questioned the legitimacy of this practice in any direct way addressed either to the Hungarian authorities or to me.

It is ridiculous to say that Soviet scientists, whose excellent abilities Carlucci gives due credit to in his reply, are in need of a Hungarian aide-de-camp in reading scientific literature or in visiting the very same laboratories.

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Circular A-21 Negotiations

Colin Norman, in his article "Faculty v. OMB: One more time" (News and Comment, 5 Feb., p. 642), discusses the Circular A-21 negotiating process and the views of Serge Lang. Lang's views on effort reporting were often helpful and were considered throughout our discussions with the government. Unfortunately, Lang does not acknowledge the need for a process of negotiations. He has defined a position which states, in effect, that faculty cannot and need not provide any accountability based on estimates of the distribution of activities. He argues that, in the recent series of discussions with representatives of the Association of American Universities (AAU) and Council of Scientific Society Presidents (CSSP), the government has not in fact negotiated, but has simply brought the university representatives to its position by refusing to consider others. This is not at all what has occurred.

Last summer, AAU and CSSP began a cooperative effort to bring about changes in federal effort reporting requirements. We believed that new requirements could be written that would permit universities to account for their use of public funds in ways that would be more compatible with the academic environment. The Department of Education, the Office of the Vice President, and the Office of Management and Budget (OMB) urged us to propose language that would accomplish that objective.

On 2 September, AAU and CSSP representatives met with a federal interagency task force to review draft language prepared by our joint task force. During the meeting, we agreed to revise the language by adding "after-the-fact-confirmation" of activities performed by faculty and by specifying examples of acceptable accounting methods.

On 11 November, the AAU and CSSP sent to OMB a proposal for modifying the effort reporting requirements of A-21; on 7 January, OMB responded in the *Federal Register* with its proposal, which was in many respects consistent with ours. Unfortunately, OMB did not agree to all of our requests, but it did incorporate a number of our recommended changes, which substantially improve reporting requirements. Among those changes are the following:

- A more explicit recognition that estimates of the distribution of activity, not precise assessments, are expected and that *individual* employees themselves need not bear the burden of "effort reporting."
- The use of general principles and criteria to determine the acceptability of methods and the acknowledgment that there is no single best method, that differences among institutions require flexibility in devising documentation procedures.
- The acceptance of the concept of a residual category to limit the reporting detail and the acceptance of alternative methods such as statistical procedures, surveys, and negotiated fixed rates.

The general approach adopted by OMB was reasonable: institutions must document effort, both direct and indirect, if they expect federal reimbursement for that effort; if federal funds are not involved or if institutions don't wish to be reimbursed, no documentation is required.

The OMB proposal does contain ambiguities. Some of them are the unavoidable by-products of providing flexibility to institutions in devising their accounting procedures—one of our principal goals in discussions with OMB; to that extent, such ambiguities are necessary, if not desirable. Other ambiguities seem quite clearly to be simply unintentional drafting errors that can be expected to be clarified during the comment period.

In an adversarial government-university relationship, ambiguities define a battleground. In a cooperative relationship, they can provide the flexibility that will enable our differing institutions to account for federal funds with systems that are consistent with their own unique circumstances. There is good reason to believe that we are commencing a more harmonious government-university partnership. The proposed OMB revisions to Circular A-21 are both a symptom and product of that relationship.

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