AIM ADVISORY GROUP MINUTES - 4/22/75

PARTICIPANTS: Drs. Amarel, Baker, Bobrow, Brewer, Feigenbaum, Feldman, G. Miller, Lederberg, Lindberg, Reddy, and Safir as well as Dr. Levinthal, Mr. Rindfleisch, and Ms. Carpenter.

FUTURE MEETING SCHEDULE: Participants agreed to meet again by telephone on May 6 from 10:00 to 12:00 PDT. Dr. Miller will not be able to attend.

The following meeting will be in person during the AIM workshop sessions at Rutgers on 6/17/75 from 3:30 to 5:30 EDT.

The Advisory Group meeting was held by telephone conference on April 22, 1975 from 10:00 to 12:00 PDT. A number of participants were also connected by terminal (see Attachment C for instructions). The terminal connections allow access to the latest versions of files (agenda, proposal summaries, etc.) relevant to the meeting. These files are found in a special, files-only directory names <AIMADV>. All members are enabled to a group which allows connecting to <AIMADV> without a password. More detailed information about the protocols for group access to <AIMADV> are in attachment D. Participants are encouraged to review these files before the meeting (announcements of new material are made by the on-line mail system) as well as be logged in during the meetings.

For those unfamiliar with the TENEX system, we would be happy to assist in getting started - please telephone Tom Rindfleisch at (415 497-5569.

The on-line documents prepared for this meeting are appended to these minutes and include:

A. Meeting agenda
B. AIM committee membership list
C. Instructions for the CONFER program
D. AIMADV access protocols
E. Questionnaire for prospective SUMEX-AIM users
F. University of Massachusetts (Amherst) proposal w/o backup materials
G. Gedye pilot project preview material
H. AIM workshop plans
I. Plots of system loading for April

Dr. Lederberg acted as chairman for this meeting pending election and installation of the permanent chairman.

1) AGENDA ITEM 1:

The first order of business was to select a permanent chairman for the Advisory Group. Dr. Lindberg was nominated and unanimously elected to that position. A current listing of the AIM committee structure and membership (including staff) is contained in the file <AIMADV>AIM-COMMITTEE-MEMBERSHIP (see Attachment B).

2) AGENDA ITEM 5:

The next item of business was a discussion of the SUMEX-AIM Advisory Group role.

Dr. Lederberg emphasized the dual role of the Advisory Group; on the one hand a restrictive function of reviewing and validating candidates who want to come on the system and on the other, a recruiting function. The latter function is at least as important in the current mode as the former and includes disseminating information about SUMEX-AIM and providing advice about projects which ought to apply for admission either as formal or as pilot projects. A discussion ensued about the best approach for locating and encouraging high quality prospective projects as summarized below.

Drs. Feigenbaum and Feldman raised the possibility of using the Computers and Mathematics study section as a mechanism for alerting prospective projects of the SUMEX-AIM opportunity. After discussion of the pros and cons, it was generally agreed that the study section context of critical project review was a very delicate setting for suggesting SUMEX-AIM as an alternative to purchasing a separate computer for example. A preferrable approach could be to make available and discuss such an alternative either at an early stage of proposal preparation (through guideline information from NIH, e.g., the "NIH GUIDE") or during the site visit process.

Dr. Feigenbaum suggested that another source of potential projects could be promising proposals which did not get funded as a result of study section review not because of inherent low quality, but because of too much divergence of opinion in the study section or because the proposal concept needed to be worked out in more detail.

Dr. Amarel felt that the only way the Advisory Group could deal with such cases was not as a group but to delegate responsibility for assistance in each given case to some subgroup or individual. He asked what the experience to date was.

Dr. Lederberg responded that sources for prospective users had been pretty random but that the situation is optimistic. Several new projects of good quality are on the system. He estimated that another 3 to 4 major projects and 5 or 6 minor or pilot projects could be accommodated before the system saturates unbearably. Dr. Lederberg also reiterated the desirability of establishing good informational contacts with groups proposing AI-oriented health research which have some background and their own plans for solving their computing problems but for whom SUMEX would like to be considered as an alternative. For these groups the study section may be the only reasonable intermediary in spite of the problems of steering a careful course between the sensitivities of the

investigator and those of the NIH.

Dr. Lindberg pointed out that in addition to trying to catalyze the formulation of high quality projects within interested, semi-knowledgable groups, SUMEX ought also to allocate part of the resource for demonstrations to provide information about on-going research at medical schools and centers. Dr. Lederberg expressed the SUMEX project's agreement with that idea and that we should encourage the individual projects to establish such contacts - they are the appropriate ones to take the lead. The MYCIN project and the Rutgers project are already doing some things like that.

Dr. Safir felt that such educational contacts would certainly be useful and would happen soon but that they could not be initiated prematurely. He feels the glaucoma programs need some additional improvements before things are really ready.

Dr. Amarel emphasized that tuning programs and adapting their human interfaces to such an audience required considerable effort beyond the central scientific goals involved in their initial development. He noted, however, that this type of dissemination was a central component of the SUMEX-AIM enterprise. Dr. Lederberg agreed, indicating that a large part of the philosophy behind the new user questionnaire (see attachment E) was aimed at informing and filtering prospective users with respect to these objectives. He also suggested that funding agencies must begin to consider such "publication" aspects of computer research more explicitly.

Dr. Amarel suggested that the Advisory Group might consider investigating this question of program publication and documentation to provide some guidelines and procedures for the various SUMEX-AIM projects.

Dr. Safir raised a question about the legal issues involved in public access to software resulting from government supported research efforts. He was particularly concerned about the right of an investigator to withhold such material while it was still in a phase of active development; or whether it was prescribed for public release even before the P.I. believed it was suitable. The general consensus was that no definitive legal rulings had been made but that the trend was toward viewing such products as being in the public domain, perhaps even at unreasonably early times, judging from judicial decisions releasing research-grant-application data. From a practical viewpoint, there is some reasonable interval during the major developmen
**t phase
of a program when dissemination is not feasible, desirable, or required as is the case with information developed in other scientific research areas.

Dr. Feldman pointed out that a constituency within the study section was developing for whom a major criterion of success of AI (and other) projects was the extent to which research products become well known and find use in a variety of medical contexts - not just within the development groups. Support for "ivory tower" research efforts will not last long.

Dr. Lederberg responded indicating that we were well aware of the importance of such goals and that fully 3 or 4 people were actively working in the DENDRAL project in the "expert" business, both in adapting the programs to non-expert users and in demonstrating them and holding hands while they get started. At the same time the study section demands this kind of public dissemination, they must accept the price tag of doing it. For some research efforts, this could easily amount to $100,000. Dr. Amarel agreed and indicated that the Rutgers group was active in this area as well. Dr. Feldman noted that the advisory group should spend effort emphasizing the importance of such publication to all AIM projects and actively encouraging devoting measurable effort in these areas.

Dr. Saffir pointed out that there may be other legal issues involved in extending such experimental programs to contact practicing physicians as to the liability for the advice rendered by the programs. All agreed that this is a most important issue and that very specific disclaimers must accompany such applications of the programs. Dr. Lederberg emphasized that investigators had to be extremely careful to get a complete waiver and that must include ensuring a complete understanding of what the program purports to offer in the way of medical assistance. The programs should include appropriate cautionary remarks in their heralds.

3) AGENDA ITEM 3:

As Dr. Reddy had to leave early, the discussion turned to the pending proposals for admission to SUMEX-AIM. The discussion focused on both specific issues related to the three proposals in various stages of submission and on general policy questions about the criteria and expectations for reviewing new projects. Dr. Brewer reiterated the role of the Advisory Group in advising the Executive Committee where the final decisions would be made. He also emphasized the confidentiality of these discussions and proceedings of the group.

University of Massachusetts Proposal

The first part of the discussion covered the proposal from the University of Massachusetts. The proposal itself was distributed to everyone but the backup material only to Drs. Bobrow, Feigenbaum, Reddy, and Lindberg for review.

Dr. Reddy assessed the proposed work as pursuing some interesting ideas in AI (imaging in particular) but having very limited initial contact with medical problems. He felt that while he personally might disagree with some specifics of the proposed work and approach (e.g., pyramid representations in scene analysis), the ideas were reasonable and were worth exploring. He expressed the concern that there may be a tendency toward super-critical review of proposals from groups other than at the few established AI centers and that others should be given a chance. Aspects of the proposed work (e.g., semantic vision analysis) involve a fair amount of hand-waving in their approach but this is true of everyone else as well - even the established centers. Dr. Reddy favored an interim approval of the admission with a subsequent review in a few months or a year to verify quality and to assess whether adequate medical relevance had been established. Upon unfavorable

re-review, they could be denied further access to the system.

Other members of the group (Drs. Feldman, Feigenbaum, Bobrow, and Lindberg) expressed concern about the quality of the work from an AI viewpoint and reemphasized the opinion that medical relevance was a poorly integrated after thought. Dr. Feldman had not seen all of the current proposal material but had reviewed a prior NSF proposal and felt there were few exciting prospects in the AI work proposed. In general, these members felt more concern about the lack of demonstrated insight into how to solve the problems posed in the proposal and were less willing to give the proposal the same benefit of the doubt as Dr. Reddy.

It was agreed to table action on the proposal until the next meeting after all members of the group had had time to review the detailed proposal materials. Dr. Levinthal agreed to arrange for its distribution.

GEDYE PROPOSAL

Two other proposals were discussed very briefly; one beginning as a Stanford pilot project (Dr. Gedye) and one proposing to become an AIM user. Dr. Lederberg asked the Advisory Group's assistance in evaluating the Gedye proposal (see attachment G) and asked if there were any committee members who had knowledge or comments on the work which relies heavily on the pattern recognition ideas of R. H. Atkins. No comments were forthcoming and the matter was deferred indefinitely based on Dr. Lederberg's judgement that very limited facility use could be anticipated by Gedye in the near future.

BAER PROPOSAL

A proposal for access from Dr. Baer was briefly discussed next. Relevant materials had been mailed the week prior to the meeting but had not been received by all members. Dr. Baer is a software consultant to Dr. Walen at the Naval Regional Medical Center in the bay area, working on some computer programs to assist and evaluate the ability of paramedics to manage the initial care of people with hypertension. They are now working on a small computer system and are running out of file space. They may need up to 10 million words of file storage in the next year (that is 1/7 th of the current SUMEX file system). The AI relevance of the project is very unclear - Baer's position is that his type of data based decision making is AI although he is not at all familiar with existing AI literature.

Pending review of available materials by the committee members who have not received copies yet, further discussion was deferred to the next meeting. In the meantime, Dr. Lindberg agreed to contact the applicants to obtain a clearer view of their medical quality and relationship to SUMEX-AIM objectives.

POLICY ISSUES

In the course of the proposal discussions, several policy issues arose. Dr. Bobrow asked to what extent the available facilities should be used to try to push people doing pure AI research toward medical relevance. Dr. Feigenbaum pointed out that this was but one extreme in a spectrum and that there would also be groups doing good medicine who could be pushed toward AI. In response to Dr. Lindberg's question about how to define the middle ground, Dr. Lederberg suggested that the ideal proposal would clearly be one producing a maximum of fundamental insights, innovations, and creativity in computer science within the context of the highest priority medical problems - he allowed as that there were some problems in finding such proposals as the people concerned about the most immediate medical issues are not likely to be the same ones preoccupied with more general theoretical problems.

Dr. Feigenbaum pointed out that there was no document out in the literature defining what AI really is but that a number of papers on various aspects of that subject were available. He agreed to distribute copies of Nilsson's 1974 IFIP paper and one that Dr. Feigenbaum had prepared recently for ARPA.

Dr. Feldman emphasized that one had to be careful of tokenism in guiding proposal writers toward the medical/AI ideal. It is easy to say the right things, substituting medical images for other scenes for example, yet the medical and scientific merit may not be noticably improved except symbolically.

The general conclusion was that no inclusive definitions or criteria could be put forth and that the Advisory Group must exercize expert judgement on an individual basis to determine the optimum allocation of SUMEX-AIM resources to projects which will balance the ideals of creative computer science research in important medical areas. This is in fact a major function of the Advisory Group.

A corollary issue was discussed concerning the extension of trial periods to projects which are difficult to judge at first hand in terms of combined medical and AI quality. Such leeway would require making firm decisions about kicking non-productive projects off of the resource when necessary. Dr. Reddy advocated that taking such a hardline was both appropriate and feasible where necessary, suggesting that it would be impossible to fairly review some projects without a trial period. Drs. Feldman and Lederberg acknowledged the desirability of giving projects a chance but were skeptical about the feasibility of denying them further access if unproductive because of the large inertia in say a years worth of work. No specific conclusion was drawn other than this sensitive problem must be taken into account on an individual basis in reviewing the scientific credibility and potential of each prospective user and deciding how much leeway to afford projects in achieving demonstrable medical and AI importance.

4) AGENDA ITEM 2

A brief summary was given that the system was now up and operating on both the TYMNET and the ARPANET. The system is being used by an increasing number of users from within and without Stanford. Data for April showing various dimensions of system usage are given in Attachment I. Current versions of these data can be found on <BULLETINS>DIURNAL-LOADING-WEEKDAYS.date.

5) AGENDA ITEM 4

Dr. Amarel summarized the AIM workshop plans to date, directing Advisory Group members to a file, <AIMADV>AIM-WORKSHOP.PLANS, which was entered the night before the meeting. Few members had had time to review the material for this meeting. [Copies have been distributed to all members since then].

Plans are moving forward at high speed now with invitations being mailed for both the general session on June 14 and the technical sessions the following 3 days. The Rutgers group expects to have a mid-May rehearsal of the program and will develop definite plans for a computer backup system for the workshop.

The first day of the workshop will include sessions on Comparison of AI Approaches (chaired by Dr. Feigenbaum), one on Medical Perspectives (chaired by Dr. Safir), and one on Resource Sharing and Policy Issues (chaired by Dr. Baker). The technical sessions will be less structured allowing much time for individual activity to interact with the programs and research personnel. The second day will feature a dinner keynoted by the President of Rutgers and Dr. Bill Raub of NIH. The technical sessions are mainly oriented to people who are active on the system now and their collaborators and to people close in terms of potential use of the facilities.

Dr. Feigenbaum indicated that Dr. Winograd had expressed interest in attending the workshop.

Dr. Lederberg suggested that it will be important at the next meeting of the Advisory Group to refine some of the policy issues brought up at the present meeting so that these could be incorporated in materials which can be made available to participants of the workshop meetings.

6) AGENDA ITEM 7

There was no additional business from the floor and so the meeting was adjourned until the next meeting by telephone on May 6 at 10:00 PDT.