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DIVISION OF PHILOSOPHY,
THE SOCIAL SCIENCES, AND EDUCATION

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Dear David:

Since we talked briefly last month about computerizing Kettering's public agenda files, I've been thinking much about it. Megan Scribner has sent me samples of the abstracts she makes, and I have your recent memo on the Catalyst Library. Several steps should be followed, I think: start with the first step, relatively simple, by creating a database management system tailored to the abstracts and to your in-house uses of them; with that set up, go to the second step, much more challenging, of drawing Kettering's constituencies into participating in expanding and deepening the database; and proceed as well to the third step, most challenging of all, of transforming the dialogue with Kettering's constituents into an educational process that reachs beyond established constituencies, one that would serve as a unique and powerful source for educating publics on the matters central to Kettering's agenda.

In what follows, I indicate what might be done to accomplish each of these steps, with some rough estimate of how long it might take to do it, and then I describe how I would like to involve myself in these efforts should you be interested in having me do so.

Step One. Essentially, for this step, we need to design and program a database for storing the abstracts, for searching rapidly through them according to key concepts, and for recalling them in as efficient and flexible a way as possible. Megan tells me there are now approximately 2,000 abstracts, and from the samples she sent each would probably require a record some 2,000 characters long -- that means 4 megabytes of disk storage already, tripled for immediate purposes, to give room for expansion, so the basic hardware needs for a usable first version would be a good micro, probably an IBM PC with a hard disk of at least 12 megabyte capacity.

Commercial database programs could be used, although most have limits on the size of the records allowed that would make them less suitable for this particular application. Although I have used the term database, as

it is the proper general term, we should think not of data, but of ideas, of creating an 'ideabase', and for that we need to design, not merely something to store and retrieve information, but something through which one can cultivate ideas, facilitate reflection. Such systems are not on the market and we should plan to write a special program for the project in which we try extend database design, which is well developed and an easy point to start from, as far towards a good 'ideabase' as we can manage. To do that, some careful thought should go into planning out precisely what fields should be included in the declaration of the basic record format, what search and display capacities should be build into the program, and what other capacities should be available through it to its users. In short, we need to plan out what functional features we want an 'ideabase' to have.

To facilitate that planning, I would suggest that I get up a rough working prototype from the material I have here, setting it up to show tentatively the kind of functions that might be built into the program. With that mockup, I would then come out in late April, which would be the earliest I could do it under present constraints. At that time, a group of us would spend two or three days systematically refining and elaborating the design specifications. I would hope the group would have both skilled programmers and people well versed in the intellectual concerns to be served. This effort should result in a full, detailed specification of the program which then could be coded and debugged relatively quickly. I would expect that a working version could be ready by August, plus or minus depending on how concentrated an effort could be made on the coding and on how esoteric some of the features of the working design turned out to be.

With a working version of the program, one of the more onerous chores of the project could then proceed, entering into the 'ideabase' the 2,000 odd accumulated abstracts. Once those have been entered and it becomes possible to build up experience using the program, the desireability of revisions to it will undoubtedly become apparent -- the relative ease of incorporating such improvements into a program is one of the virtues of computer systems. To my mind, you should think of the program that is to result from Step One as an inhouse, preliminary version of the project, useful primarily for converting the existing abstracts to computerized form and for building up the basic skills of those managing the abstracts for working with them routinely in computerized form. I would try with Step Two, however, to make the system considerably more sophisticated.

Step Two. Here I should start with some technical considerations. A good micro with a hard disk would be adequate for a strictly inhouse version which would be used by only one person at a time. For a version that can be usefully accessed by Kettering constituents, it should be based at least on an advanced multiuser microcomputer system so that many people could use it simultaneously. What sort of system should be chosen? To answer this question, one should consider operating systems and the computing context into which the project should develop.

Operating systems allow people and the applications programs they want to use to work with the raw computing power of the central processor and the diverse peripheral hardware attached to it. An operating system, thus, is somewhat like the gear train, breaks, shock absorbers, and steering mechanism in a car -- how well and how safely one can drive depends largely on the quality and design of these. Now I would guess that most computing developments going on within Kettering are primarily in the context of "office automation" and when one moves beyond the level of micros with CP/M or PC/DOS, in the context of office automation one encounters proprietary operating systems developed by and for the major hardware supplying firm -- Wang or IBM or who have you. When they are good, these operating systems facilitate the integration of diverse office functions into a working package within an organization; in short, they automate the bureaucracy. Unfortunately, these operating systems are usually not good as a computing environment for developing new ideas and functions, nor do they provide good resources for software engineering, nor do they necessarily facilitate easy access by diverse participants in an intellectual network.

Since the project, particularly at this stage and beyond, will involve developing new ideas and functions and some thoughtful software engineering and a reaching out to participants beyond Kettering's immediate office organization, I think its computer base should not be drawn from the context of office automation, but rather from that of academic computing and from research and design applications of computers. Thus, the question of the right operating system comes down to choosing one, not that will relate best to the office network within Kettering, but that will be maximally usable to the widest network of Kettering constituents as possible. For this I would suggest that the database be moved up to an advanced multiuser microcomputer that can run the Unix operating system. I think that if such a move is made at this stage it will greatly enhance the long range capacity to develop the system even though in the short run it will be somewhat more expensive and will require some fundamental skill development on my part and I imagine on the part of others involved in the project.

If such a change is made, developing the system beyond the direction you indicate with the Catalyst Library, where the Kettering constituency draws on the database for specialized information, should become feasible. With this further development, the constituency becomes an active source of material entering into the repository organized around the database of abstracts. To do this, a file transfer program such as Kermit, which is an excellent program, free to non-commercial users, maintained here at Columbia, would be needed, and the whole system would become a good deal more complicated, not just one database, but that database in expanded form and a considerable number of text files, large and small, that constituents would draw on and contribute to, and further, undoubtedly, a number of specialized programs, the nature of which cannot really be anticipated right now, that users would employ in making use of the substantive files and abstracts.

Here, frankly, I will have to learn more before I could be very explicit about what should be done. Essentially, hardware would have to be

attached to a base computer at Kettering to allow external users to telephone in and the software to control the process would have to be acquired or developed. All this is a matter that the right technical specialist can easily handle; the main problem in it: finding the right balance between cost and capacity. The substantively more interesting problem would be that of building up further files in addition to the database of abstracts. The basic question to which answers will need to emerge is fundamental: how will thoughtful people best work with thought-provoking materials through a computer network. Two goals, I think, should guide work: first, to create a central repository for extensive text files that the Kettering constituency would contribute and use, with the indexes and abstracts of its components to be maintained by Kettering; second, to develop certain new kinds of programs that would facilitate the productive employment of such a repository by its users. Step Two, thus, would rather link the functions of an electronic library and electronic publishing, and mediate both those functions with some novel programming, the upshot of which would be to advance further beyond the computer's effectiveness as a tool of information retrieval and make it yet more decisively function as a powerful tool for reflective inquiry. This extension need not be terribly costly, but relative to what one sees typically going on now, it would require creative, imaginative advances in how to link what is technically feasible with what is substantively interesting in our culture.

This step could begin next fall, basically by getting the right hardware running Unix, bringing Kermit onto it, learning the C programming language, which is basic to Unix, writing a new version of the database program from Step One in C and moving the contents of the database onto the new system, attaching the system to the communications hardware, then beginning to build up a base of users from the Kettering constituency, and finally encouraging those users to become, not only consumers of the information in the data base, but participants in a dialogue, active contributors to the database. A lot of program design and development would need to be done to facilitate use of the system, and this will be not small task. When you say, "you don't even have to have the books these days, just the software," you may not realize how much can be entailed in the 'just'! A very, very powerful system can be developed, but the requisite software won't be found packaged over the counter and it will take a great deal of work to develop it. For the sort of activity we have in mind -- let us call it engendering a higher level of public thoughtfulness -- new kinds of programs will simply have to be invented, for what will be needed is not simply a well-targeted information retrieval system such as Nexis, nor an expert system useful in medical diagnosis or oilfield exploration or weather forecasting, nor a system of artfully programmed instruction. What will be needed may borrow elements from these sorts of developments, but it will have to integrate them into something that preeminently serves the needs of reflective readers and writers. Unless it can create means for facilitating reflection more effective than other means available to people thinking, it will rightly fail to attract and hold a thoughtful group of users.

Step Three. If Step Two can be brought off, and I think it can, the result would be a certain intellectual ferment among those channeling their thinking about the public agenda through the Kettering network. The test of the intellectual value of the network would be whether or not those using it could form their ideas with greater effect -- with greater depth, reach, and conviction -- than they might otherwise have been able to do. Step Three, which would overlap with the previous one, would consist essentially in finding ways to turn the dialogue centering on the Kettering network more and more effectively out into the public arena. We might put the difference between Steps Two and Three as follows: to carry out Step Two we need to discover how to make the Kettering network most effective as a tool for thinking about the public; to effect Step Three we need to find how to make that network most effective as a tool for teaching the public how to take part in a widening dialogue about itself.

We are only at the very early stages of learning how computing technologies can be incorporated into the processes of education. So far, attention has centered on computers as tools of instruction, the subjects of instruction being taken as relative givens. I suspect that the real transformative influence of computing will emerge as educators realize how computing may make possible the fundamental reorganization of the various subjects of instruction as long-established constraints on the presentation of material give way to more powerful, flexible, and open modes of presentation. I think the project could convert its database and the dialogue centered on it into a powerful component of formal and informal education. I shall try to explain briefly what I think may happen here.

Traditionally the curriculum has consisted of bounded subjects of instruction, and the ultimate reasons for the boundedness, I think, lay in the fact that at each stage, each subject had to be packaged in a usable set of books, the physical limitations of which established certain ineluctable boundaries that become the boundaries of the subject at this or that level. Computing is in the process of breaking those boundaries -- teachers and students will be able to have virtually immediate access, not merely to what is in the text, but to any part of to the totality of a subject at any moment. The problem of pedagogy will cease then to be one of learning how to work oneself up to full access to one or another field; it will become instead one of reflectively deciding what to do with the unlimited access that one in fact has. If at any time one can attend to any part of our cultural repertory as one sees fit, no constraints limiting access, instructive discourse then will consist of discourse that illuminates the choice to attend to this rather than that. Such reflective discourse about the worth of various ideas that may be claimants to public attention will be precisely the discourse engendered if Step Two succeeds. The point in Step Three is simply: in a cultural environment of relatively limitless access to ideas, such discourse as that engendered in Step Two, insofar as it guides and informs the allocation of attention, takes over the functions once performed by a curriculum structured into limited subjects.

If I am correctly anticipating the course of development, Step Three will consist less in design and development efforts and more in subtle attention to situating the results of Step Two in a newly emerging pedagogical environment. Certain measures will help make the network of discussion more easily and widely used as a means of informing the allocation of attention. These will consist primarily, I think, in an effort to identify, employ, and extend the diverse new modes of teaching and study that will be discovered as people adapt to a different communications base for educative effort. People will be changing the ways they study and teach all aspects of the culture and 'ideabases' in the sense here contemplated will structure the operative stock of knowledge in the way that the formal characteristics of the curriculum have done in the past.

To summarize, observe that the distinction between Steps Two and Three is a bit difficult because, in a sense, it consists of two successive propositions about the same thing: Step Two entails developing a computer-based system of communication that goes beyond being a means of efficient information retrieval to becoming a means for better engendering reflection on fundamental issues substantively contained in the 'ideabase'; Step Three consists then in recognizing that such a computer-based system will replace the traditional use of a curriculum as the basic means of organizing a culture for transmission over time. Operationally this means adapting the fruits of the network for use by students and teachers, in formal settings of education and in informal settings. Some further thoughts about the directions to be pursued in that effort can be found in the attached letter to Mike Timpane. Understood in the way here outlined, Step Three could begin fairly soon, concomitant with Step Two, but it would go on indefinitely for as long as we have a culture to nurture through education.

In all this I may have wafted off into a yonder far from anything you want to contemplate, let alone involve Kettering in. But I still claim with these ideas to have, like Antaeus, my feet on the ground, and if I understand what you started at HEW and what you have been pursuing since, the steps outlined above point precisely to <u>an aspect of</u> what you want to engender through your civic agenda. They also point precisely to an aspect of what I want to accomplish through the Laboratory for Liberal Education, a design and development project that I have started here at Teachers College, as you know. Our respective endeavors are highly complementary and I hope that a joint project, moving along the lines outlined above, might be worked out.

Through the Laboratory I want to do the kind of developmental work described above. I am convinced that for good or ill computers and telecommunications systems are rapidly becoming the main access channels to information and ideas for important parts of the population. I am worried that unless people like myself get cracking important components of our humanistic heritage will not make their presence felt through those access channels. Such a shunting aside of the liberal tradition would be a cultural disaster, compounded because, so it seems to me, when one cuts through all the traditional stereotypes and inert aversions to these changes, one sees that the development occurring in

computing and telecommunications presents a great, unrecognized opportunity for renewal of our liberal and humanistic resources. Thus I come at these matters driven by the stick of foreseeing a cultural desiccation if we don't get our value-bearing tradition prominent in the environment of electronic communications and urged on by the carrot of believing that we have an unparalleled opportunity for a twenty-first century renaissance if we can get that tradition powerfully articulated in the new environment. Electrify the humanities: that is my agenda. In this effort, I possess two basic strengths. First, I am richly learned in the best that has been thought and said in print. Second, I am proving to be a very fast learner with respect to computing. The Laboratory will provide me the framework for using my traditional learning and technical facility to design and develop the cultural innovations that I seek.

I need two things for the Laboratory. First, and most important, I need to find for the Laboratory arenas of concrete application in which to put to use the capacities to articulate the liberal heritage in a computing environment that may be developed through the Laboratory. Second, and trivial although alas unavoidable, I need to locate assistance in equipping the Laboratory with the basic tools that must be mastered if really good liberally educating systems are to be developed. Mere access to the tools is not sufficient; one must make them the daily tools of ones daily work so that one learns not merely to know about them but to think through them, so that they become second-nature and a transparent medium for creative work. So far, I've been more or less able to equip myself, but I am reaching the level -- essentially that of Step Two above -- where I should be beginning to work daily with somewhat more sophisticated, specialized equipment which I am not reasonably able to fund myself.

In the light of all this, I would like to explore your willingness to enter into a joint project with Teachers College and the Laboratory. In this joint project, Kettering would agree to provide the host site for its network, equipping and staffing it according to the level that you saw commensurate with your capacities and interests. In addition, it would provide a basic equipment subvention to the Laboratory, either funding a basic software development system -- something on the order of $20,000 -- or helping in finding third-party funding for such equipment. Teachers College would in essence be contributing the housing of the Laboratory and the portion of my salary that goes into research. I would be contributing the full commitment of my research energies to the project, understanding that the related activities outlined in more detail in the letter to Mike Timpane would be a part of these activities, contributing to the emergence of Step Three, as would exploring applications in schools and colleges for the 'ideabases' being developed. I would expect that any intellectual property rights that might develop out of the joint project would be shared by Teachers College and Kettering as the sponsoring institutions, with both of those allocating a portion of such rights to the Laboratory to support the maintenance and upgrading of its equipment. Such are the basic arrangements that could sustain a fruitful long-term collaboration.

There would need, of course, to be numerous details to work out in getting such a joint project under way. I am sure, however, such details can rather easily be resolved if we indeed possess a shared intent. On that, I eagerly anticipate your reaction.

Can it really be that marriages are impending? Does time so quickly pass?

Sincerely yours,

Robbie

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