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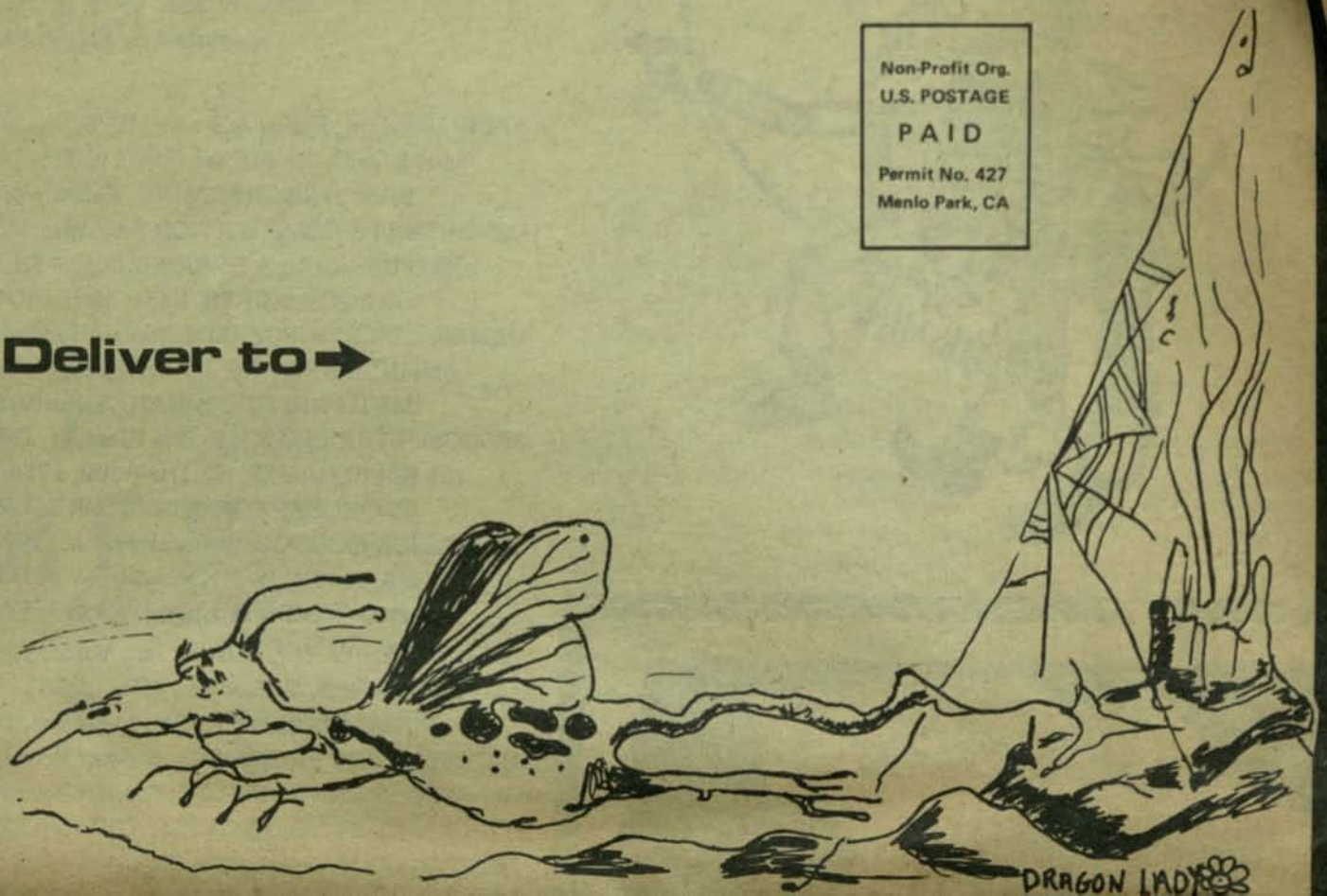

PEOPLE'S COMPUTER COMPANY

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Hardware Issue

PCC

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PCC is a not-for-profit corporation. The newspaper is about recrational and educational uses of computers — computers for everyone. PCC is published 6 times during the year.

Subscriptions are $5.00 for 6 issues. ($6.00 outside the U.S.A. — surface mail; $12.00 air mail.) Subscriptions begin with the July issue.

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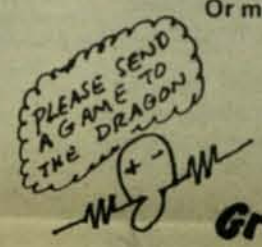

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PCC News & New Stuff

THE NEW DRAGON is nameless no longer, and is growing fast. It's called Community Computer Center, is incorporated, granted tax exempt status in California (Federal application pending) and has two new rooms. One is for hardware classes, the other for a whole lot of DEC equipment. Currently, OS8 is being run with DecTape but soon, when the PDP 11 comes.....
You can still buy the PCC games book from either the PCC bookstore or from CCC, but if you decide to buy from CCC remember to make your check to Community Computer Center - saves trouble at the bank.

MEANWHILE, BACK AT PCC.....

The year of the home computer is here. Clubs and centers mushroom across the nation (8+ with 700+ members in California alone) and the demand for information grows accordingly. So too does the volume of information available. Suddenly, thousands of inventive minds have hardware to play with and the output of ideas is staggering. PCC exists as a medium through which these ideas can be transmitted, some of them..... So we are setting up a system. If you produce a program/design/article/booklet and you want to publish it through us, send it. We will catalog it and make Xerox copies available through the bookstore at about a nickel a page, plus 50cents handling and postage. If an author wants a royalty, the cost will be more - but we are not very interested in handling much that is not in the public domain. Our present staff is four part-timers and the hassles of record keeping for lots of small royalties would be too much for us. But if we feel something really should be made available and paying a royalty is the only way, then so be it.
We have also discovered that there are many valuable items, for example a DOS BASIC for the 8080, which aren't being published because the designer is afraid of his phone. *If enough people call you to ask questions, you can't get any work done. MITS receives around 1000 phone calls a day - that's 2 per minute - and has* to employ people just to answer phones. If you have something you would like to contribute to the world but don't want phone calls - send it to us. We will publish it and answer the phone. If we can't answer the question, we will try to find someone who can, and if we can't — sorry.

OUT THERE IN THE REAL WORLD

The first 16 bit computer kit is being produced, and you can have one free! To launch it, Bill Godbout is running a competition. To enter, send your idea of a good name for the beast, the name of the 'secret computer co.' which makes the chip and 25 words or less saying why you should have one. 1st prize is THE CHIP, 2nd an 8080, 3rd an 8008. And if your name is the one used for the kit - you get the whole kit. All entries must be postmarked by 1st Aug 75 and received by Bill by the 10th. They must be marked 'PCC Competition' and all entries become the property of Bill Godbout Electronics.

1ST PRIZE: 16 BIT MICROCOMPUTER CHIP!

CONTEST!

GODBOUT

BILL GODBOUT ELECTRONICS
BOX 2355, OAKLAND AIRPORT, CA 94614

2nd prize: 8080 cpu

3rd prize: 8008 cpu

We were 1st to offer the 8008 to hobbyists over 16 months ago; now we're setting the pace again with a powerful new 16 bit microcomputer IC in a 40 pin DIP, made by: the SECRET MICROCOMPUTER Co!

YOU MAY WIN ONE OF THESE CHIPS --- SIMPLY:

1) Reveal the Secret Microcomputer Co.'s true identity
2) Tell us in 25 words or less why you should receive a free chip

LSI 11 OEM BUY

We wondered (in print) whether there would be enough interest to support an OEM purchase of 50 LSI 11s. This generated about the same number of enquiries but things have happened. We ran into a legal snag, many enquiries were for business use and we are Non-profit. We also heard that Bill Godbout was planning an MSI 11 kit for release in October. It is hoped that it will run the full PDP 11/40 instruction set and be conservatively clocked at 300ns. So we are putting the people who enquired, in touch with another possible OEM buyer and waiting to see just how good the MSI 11 turns out to be.... and it looks good so far.

My Name: **Address:**

Zip: **Phone:**

I *WOULD/WOULD NOT CONTRIBUTE TO/USE* **an information bank.**

I am *STARTING/RUNNING* **a** *GROUP/CENTER:* **Publish my address and phone number.**

There is a *GROUP/CLUB/CENTER* **called:**

Contact through: **Address:**

Zip: **Phone:**

I have been *SATISFIED/DISSATISFIED* **with service from this parts supplier:**

Name:

I know of the following *INFORMATION/SOURCE* **concerning:**

The details are:

LAST BUT NOT LEAST

We are going to try to list centers, clubs and sources of information. We also want to know of kits, products and designs that are not commonly known, and which parts suppliers do a good job - quickly supplying quality parts at a fair price. And about those who don't!

The good ones we will mention - such as M&R Enterprises, P.O.Box 1011, Sunnyvale, California. Marty Spergel is a regular at Homebrew Computer Club meetings - has to do a better job, or he doesn't get out of the building intact...

We plan a postcard sized file. If you decide to help, help us some more by either mailing us the form or sending info on postcards!

Evaluative Criteria for Remote Computer Services

DON RUSSELL

Director Information Systems
Department of Public Instruction
State of Wisconsin

This document is intended to serve the purpose of assisting school district personnel in evaluating the costs, benefits and support services to be obtained by acquiring instructional computing services from remotely located services via telephone transmission methods.

Quality of Service Provided

A. Computer response time

For school districts which seek to acquire computer services for use in their instructional program, the remote computer system accessed by telephone lines is becoming popular but care must be taken to assure that the system being proposed is capable of providing immediate response. This means from the time a student types in a request, the maximum time for the computer to respond should be either immediate or at most one or two seconds. Typically, there should be no noticeable delay in computer response. These remote computers are called "time shared computers" (several people in remote locations are sharing the machine at the same time) and they are capable of this kind of response.

Response time is extremely important in educational applications because of the need for immediate reinforcement of learning. It is especially important where the computer is being used to administer drill and practice, but other interactive programs also suffer when response time is poor. It can be extremely frustrating for a student to have to wait a long time for a response. Response times as high as ten seconds can be extremely wasteful of a student's time and thirty or more seconds can be intolerable. Cost effective utilization of equipment is also needlessly depressed by poor response times. There are suppliers who will minimize the significance of this feature but inevitably investigation will reveal inadequacies in their response times, hence their defensiveness in this regard.

B. Turn around time

Turn around time is the total time for completion of an entire assignment or problem. Such a task may involve several inquiries and corresponding "responses."

A good quality time shared system with rapid response also provides quick turn-around on student assignments as well as offering the student the opportunity to do all of his work at the terminal. This is one of the major advantages of timesharing over punched card computer systems. Card oriented computer systems (also referred to as batch processing systems) are ones in which students and other users submit a batch of cards containing programs and/or data. If errors are found in the programs and/or data, the student must return to the keypunch machine, make corrections and run the job again. Coupled with waiting time, the repeated trips to the machine can make the process a very frustrating one for students. Although batch processing still has a definite place in computing, it is becoming clear that timesharing offers a better all round instructional program and is actually superior for a host of instructional applications.

BASIC

C. Programming languages

A timesharing system to be used in school districts should offer a high quality programming language, preferably BASIC, and a modern CAI author language such as Coursewriter III or IDF (Instructional Dialogue Facility). BASIC is an acronym for Beginners All Purpose Symbolic Instructional Code, a computer programming language developed at Dartmouth College for use in educational. The selection of BASIC over any other single language is based upon its design criteria: It was designed to be (a) easy to learn and use, but (b) versatile and powerful enough for a wide range of instructional applications, and (c) oriented toward the educational user. A CAI author language facility is considered a must since this area is experiencing a considerable resurgence.

D. Commands to the computer

Whatever the language it should have simple, English-like, easy to use commands which allow students and teachers convenient access to the system. Commands are distinguished from the computer program itself. Commands generally tell the computer system what to do with the program being used. Unfortunately, too many computer systems require cryptic, highly specialized commands or a rather formal "job control language." A system to be used for instructional applications must keep these complexities to a minimum since such control languages reduce the accessibility of the system and frustrate teacher and student alike.

E. Language features

The programming language should be simple and easy to use. The high school instructional program is designed for all students, encompassing a wide range of ages and abilities, and an instructional program utilizing the computer should not, and need not, be aimed at an elite group of students, but rather at the entire student body and all curricular offerings. Since computers have become an integral part of our society, it is important that all students become familiar with the nature and operation of them. Experience has shown that some low achieving students responded quite enthusiastically to instruction on computers. More advanced students can certainly be motivated and accommodated with special programs, but it would be a grave error to overlook the documented successes which have been experienced with students of less than exceptional ability.

For the above reasons and others, it is strongly recommended that the BASIC language be available and this also explains why it is the most popular language used in education today. Any language for general student use should not be abstract. Another timesharing language, APL (A Programming Language), for instance, is quite powerful but is rather mathematical and abstract and is quite difficult for the average student to use, let alone to master. FORTRAN and COBOL are not particularly abstract, but are professional programming (and thus somewhat cryptic) languages designed for scientific computation and business data processing respectively. As a result, they are much more difficult for a student to learn and use as a probelm solving tool.

F. Additional languages

Additional languages are desirable but not necessary. A common argument states that languages such as FORTRAN and COBOL should be taught in the high school because these languages are commonly used in industry. However, these languages are intended for highly specialized applications and are used largely by professional programmers. The argument that they should be taught in high school is not a strong one since students are not likely to fill professional programmer positions after high school graduation. Computers have been common now for nearly 20 years and the job market in computers is much more competitive than ten to fifteen years ago. Those who seek a career in computing are now more likely to attend a vocational school or a four year college or university to acquire the necessary professional skills to become a programmer or even to function as an operator of these complex machines.

BASIC provides enough features to teach students those concepts of computing that will serve them later in their training and career. It is much more desirable to teach concepts in the high school, rather than to attempt to provide vocational training for programmers, which could become an extremely costly project and one without a marketable product in terms of a trained programmer or operator.

G. Problem solving facilities

The computer is an extremely useful tool in a wide variety of subject areas, not just in mathematics and science. The computer may be resented as an expensive toy if it appears to be the exclusive domain of the math department. Since use in other subject areas is to be encouraged, facilities for problem solving should be available. These facilities can range from a good BASIC language where students can write their own problem solving programs, to pre-written program that do tedious laboratory calculations.

The computer is a powerful tool which students in many subject areas can program to solve problems which would be difficult to solve by hand. Hand computation tends to be laborious and too often prevents a student from perceiving the concepts involved. Once the student learns to do the necessary calculations, it is often best to free him of this burden. For example, the computer has been programmed to do laboratory calculations for some courses and as a result students are able to perform more experiments with the same time investment. This enriches their educational experience, surely a worthy return on the investment.

H. Simulation programs

Computer simulation is a process whereby a teacher can use a role-playing "game" in which the students are able to "simulate" some real life process. As a result one can create a rather realistic laboratory experience where one could otherwise not exist. Simulation can be done without a computer, but usually the amount of hand computation required makes it impractical. Computer simulations are available in business, social studies, mathematics, biology, chemistry and physics to name just a few. Due to the wide subject range of these tools and the fact that they are usually used by teams of students, the use of the computer is extended to many more students than could actually sit at the terminal at one time, thus multiplying the student/machine ratio beyond the obvious (but inaccurate) one-to-one ratio usually perceived at first thought.

POLSYS – Political system simulation which is brutal to figure out but is exciting once you do. This simulation is designed to teach students how political decisions can be influenced by community action at the local government level. It is a rather modern simulation in keeping with the times and the 18 year old vote.

SLITS – An "extended Lab" experience for students who are learning about Young's Double-Slit experiment. Like the others, this program comes complete with a mini-text and lab guide.

A sizable package of simulation programs should be available and should encompass a wide variety of subject areas. The most noteworthy effort to date has been the Huntington II Computer Project, which was developed at State University of New York in Brooklyn under NSF sponsorship. Huntington II has produced a large number of high quality computer simulation games for use in secondary school classrooms. In addition to subject area enrichment, they offer a means of increasing student motivation and encouraging use of the computer by teachers outside mathematics. Numerous other simulations are also available and are invaluable tools for the classroom.

Any timesharing network proposing to serve the instructional user should have the entire package of Huntington II programs available in the system library, as well as many from other sources.

I. Computer Assisted Instruction and Computer Managed Instruction

When considering future needs, educators should consider expansion into computer assisted instruction (CAI) and computer managed instruction (CMI).

In "classical" CAI, the computer is used to either tutor or to administer drill and practice directly to a student. Such an application requires many hours of time at the terminal by a large number of students and, if not properly administered, could work to the detriment of a typical high school program. Yet when the terminal is not busy with other uses (which should have higher priority), it can be effectively used for some CAI applications. Summer use is probably a good example. A large number of drill and practice programs for use in elementary and remedial instruction are being collected and use of these applications particularly during summer and other "off-periods" is expected to grow considerably in the future.

In computer managed instruction (CMI) the student receives no direct contact with the computer. Instead, the computer is used to record his progress, to assist in proper student grouping, to relieve the teacher of some of the burden of record keeping and to improve the quality of the information recording and reporting process. Because individually guided education programs, such as Wisconsin Reading Design and Developing Mathematical Processes (DMP), impose massive record keeping and student grouping burdens on teachers, this educational use of the computer is expected to grow considerably in the future.

Rapid growth is expected in CAI and CMI in the near future, much, but by no means all of it, in the elementary school. The computer will offer teachers the capability of individualizing instruction much more than personnel resources have ever allowed in the past. In areas such as mathematics drill and practice, packages are already available that allow schools to give individual attention to a student that would have been prohibitive because of limited teacher time.

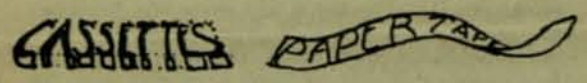
Computer managed instruction, although quite new, is growing very rapidly, and with computer costs coming down, it is probably only a matter of time before many schools have computer record keeping at least for individually guided education programs.

Although the initial thrust in CAI and CMI is expected in the elementary area, it is also expected to affect junior high schools and high schools since they typically must find some way for accommodating differences in background among their students and for assisitng in the remediation process where necessary. These applications are also assisting the process of individualized instruction and will address the same record keeping problems at these age levels.

Thus, timesharing networks should at least offer their participating schools the potential to expand into the areas of CAI and CMI at a reasonable cost some time in the future. A CAI author language as previously mentioned should be a highly desired feature of a proposed system.

J. Facility for programming

The system should provide the capability of teaching programming and computer science, in other words the ability to use the computer as an object of instruction. Instruction in computing and computer programming is an important and rapidly growing new subject area in high schools and colleges. The terminal offers a facility for students to write, debug and run their programs and enough capability to teach most of the basic concepts involved. Instructing students in programming without such a facility represents a nearly impossible task. It is a skill such as driving a car or riding a horse which can only be learned by doing. In addition the cultural impact of the computer can be most readily mastered by actual contact with a real system.



Features of the Computer System

A. System capability

The timesharing system used should be readily usable by the novice but should still be of sufficient sophistication to serve more advanced users also. Access to a medium sized timesharing system is therefore recommended over a stand alone mini-computer located in the school itself. The stand alone mini-computer capability is likely to be less versatile because of "program library" restrictions. Also, a timeshared computer is vastly superior in terms of program size, library availability and data storage size and is also more accessible to students and teachers than is a programmable calculator, which is often suggested as an alternative usually by the vendors of these devices.

B. Language support

A timesharing system used for secondary school applications should provide the following language features.

1. It should allow reasonably large programs, typically in excess of 500 lines of BASIC code. This will insure that the system is powerful enough to handle most of the programs which a high school teacher or student is likely to write or use.

2. The computer programming language should be versatile enough to allow teachers to teach basic computing concepts. As stated above, BASIC does meet this criteria. There are other languages that do also, but as stated previously they are not easy for high school students to use and learn.

C. Library facilities

The system should have library facilities. A program library is a package of "canned" programs kept on the computer's auxiliary memory such as a magnetic disc on a continuous basis and available to every user of the system. They can be accessed quickly and executed by users whenever a particular computation is required. A library of pre-written (or "canned") programs is particularly important because they help extend the use of the computer to a wide ragne of subject areas by people with little or no knowledge of programming.

There should be a main library from which all time-sharing users can fetch and retrieve programs. This library should be protected so that users cannot alter or remove the library programs stored therein.

Users should, however, have a private library reserved for their own school use where they are allowed to store their own programs and data. This private library is important because, if students or teachers use a particular program of their own often, they may need instant access. Reading that program into the computer from paper tape may take twenty minutes or more each time, whereas the recalling of it from a private library which is disc resident would be very fast.

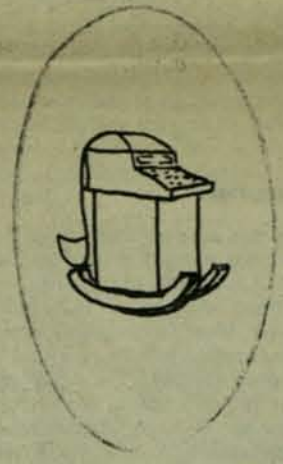
D. Off-line storage needs

The timesharing system should support paper tape, magnetic tape cassettes or other off-line storage media. Even though it can be time consuming to use, paper tape is the cheapest and most popular off-line storage medium. A roll of it typically costs about $1.00 and can store hundreds of thousands of characters of information. As a result, hundreds of programs are usually stored off-line by teachers and students in a box or desk for only a few dollars. In addition, since it is cheap, paper tape is disposable and is excellent for storing programs that are not yet in their final form. On the other hand, on-line storage such as library space is relatively costly and should be used judiciously.

Off-line storage media can also be used as a means of increasing the throughput of a terminal. If the school has an off-line terminal, students can use it to prepare their programs at human typing speeds and later enter them on-line to the computer at machine speeds.

Terminals and Communication Equipment

Other considerations which are important when looking for timeshared computing services include the terminals and transmission equipment which are used to communicate with the computer. A wide variety of these computer terminals are on the market today and attempting to select one can be a frustrating experience.



A. ASR-33 Teletype and others

The ASR-33 Teletype has been an accepted standard for some time. That unit has sometimes been compared to a Volkswagen; it is slow, noisy and ugly but cheap and dependable. Though it has some undesirable characteristics, the features it provides for its price make it the most popular timesharing terminal today.

An outright purchase of an ASR-33 typically costs about $1,000. Though rugged and dependable, it does require occasional servicing, and service contracts can often be obtained from a local supplier. Some TTY owners service their own units but this is not recommended unless there is a skilled technician on your staff. When the unit is leased from the telephone company or another vendor, service is usually provided as part of the lease arrangement. For beginners it is recommended that leasing of ASR-33 Teletypes with maintenance contract is preferred. The cost at present is $62 per month.

The ASR-33 Teletype prints at ten characters per second, about the speed of a slow reader or a fast typist. This is not the most desirable speed for some applications, but is adequate for most high schools in a computing program; also faster speeds can also exceed the speed of the reader and his ability to respond.

The ASR-33 also has a paper tape reader and punch provided at the base price mentioned above. This allows all the advantages of paper tape mentioned. On more expensive terminals these paper tape devices may cost $2,500 or more.

All of this is not to say that the ASR-33 is the only choice for a terminal. There are many finer units but typically the more features they offer, the more costly they become. For instance, those that are three times as fast are often three times more expensive and offer video displays but usually do not offer paper tape or a replacement for it except as an expensive option. Any unit selected for an instructional program should have at least as much capability as the ASR-33.

It is probably advisable to start a program using an ASR-33 and to supplement or replace it with more deluxe computer terminals that meet specialized needs.

B. Communication equipment.

Additional equipment is required to physically connect the terminal to the computer. There are a myriad of possibilities here also. In all cases, data sets (code translators) are needed at both the computer and the terminal ends of the communications line to code and encode the data signals and telephone lines link the data set at one end to the data set at the other end. Unfortunately, these transmission arrangements and costs vary widely depending on your location and distance from the computer, which makes it impossible to give a rule of thumb, but the costs can be readily computed and are of sufficient magnitude to warrant scrutiny. Some networks require the members to arrange and pay for their own communication costs individually, while others procure and pay for them for the members and charge them back as part of the fees. It is recommended that the method used be noted and the attendant costs be detailed for comparison purposes.

Some of the most common arrangements are:

1. Hard Wire. If users are within a few hundred feet of the computer, this technique generates the lowest communication cost.

2. Dial Up. This technique requires the terminal user to "call" the computer over normal telephone lines. This technique is economical mostly when one is close to the computer or is within a toll free dialing distance of the computer such as a large metropolitan exchange.

3. Leased Line. When one is a long distance from the computer or when the local telephone exchange is not of sufficient quality for data transmission, leased lines are often the best alternative. With this arrangement, fixed phone lines and data sets are connected between the terminal and the computer. No dialing is required; to get a connection one usually just pushes a button. For this service, costs are calculated on a monthly mileage basis rather than the dial-up time tariffs with which most of us are familiar. For these longer distances, remarkable low total costs can result and it is a popular technique.

Typical communication costs should not exceed approximately $90 per month; this cost would include both data sets and inter-connecting lines. Costs, however, could either be much lower or much higher than that depending on your distance from the computer site. If you are within a reasonable distance from the computer, say 50 airline miles, you should be able to (a) lease a terminal, (b) provide maintenance, and (c) pay for communications (data sets and lines) for about $150 per month in addition to the charge for use of central site services and equipment. Often, very great distances may be involved without encountering increased costs by use of state "Telpak" lines (specially packaged low-cost lines). It is best to inqurie specifically about each case. The Wisconsin Department of Public Instruction will provide this assistance when requested.

Expandability of the System

Starting an instructional program in computing and placing a terminal in your school is only the beginning. If the program is successful, you likely will have to consider the long-range future of the program. It is quite likely that you will want additional services, including additional computer time and on-line storage as well as special programs and services in the future. Additional access time and on-line storage should be available at a reasonable and published cost. You may even reach the point where you want a second on-line terminal. All of these potential services and their attendant costs should be detailed and made available in advance.

Current Cost Estimate and Level and Timeliness of Service

A. Current cost estimate

For a total cost of approximately $4500 per year (12 months), a school should be able to pay all central and communications costs and receive a minimum of about 200 hours per month of computer connect time with the majority of that time occurring during the normal school day. For approximately $2500 per year (12 months) the equivalent of 75–100 hours per month should be possible to obtain. Some time sharing systems offer dial-in service on an hourly use basis and price quotations for this may be obtained.

B. Amount and timeliness of service

The object of acquiring timeshared computing is to make it available for your instructional program. Thus the timeliness and amount of on-line computer time is a most important consideration! Unless there is enough of it, the computer is not sufficiently available to students, thereby defeating the main purpose of the program. Access at least during a significant portion of the school day is also a mandatory requirement. Some networks have allowed their member schools ten or fifteen minutes computer time per hour during the school day. The rationale is that the off-line potential of the terminal will offset the on-line restrictions. The run-time error detection features are thus lost and the pedagogical significance is inordinately lowered since limited access is an irritant which actually discourages use of the computer.

It is imperative that a school receive a generous allocation of time for the money spent! There are no clear standards, but some guidelines are as follows.

Central Site Support

A. Teacher education

The key element in any instructional computing program is the teacher. His or her preparation and leadership is the ingredient that will determine the success or failure at any given school. Those who are familiar with computers will often agree that its potential in instruction is limited only by the knowledge and imagination of the teachers using the system resources. Thus, any organization supporting instructional timesharing should provide the means for educating teachers or others who will use the service.

1. Short work shops – Orientation workshops in the use of computer terminals, often at user schools, should be conducted and these are usually sufficient to get a school started. Frequently, schools have one or more teachers who have worked with computers. They are often able to learn a system quite easily and provide the necessary leadership for their school's program. These sources are usually adequate for beginning a program, but to insure its ultimate success, more extensive training is desirable.

2. Graduate level courses – One of the most effective ways for teachers to improve their skills in this area is graduate level course work on the uses of computers in instruction. Such courses should be offered frequently at times and locations that are accessible to teachers and prerequisites should be minimal. "Computers in Education" courses should not be merely computer programming courses, but should give comprehensive treatment to the use of computers in education. Administrators should recommend that as many teachers as possible from the district take the course as leadership from teachers is far more desirable than mere technical knowledge of the computer.

3. In-service training – The school district can also help improve teacher skills by providing in-service training in educational computing. Often the entire faculty or teachers from selected subject areas can benefit from timely instruction in computer applications in their area. The network should assist in this task by providing a resource person to assist in the instruction and to make the materials available.

B. Personnel support

For those schools which decide to associate with a timesharing network or to acquire timesharing services from an educational institution, the amount of personnel support given by the central site is extremely important. The central site which provides computer time and services to school districts should be offering a full service rather than simply selling excess computing time. This practice, not at all uncommon, is proving to be largely unsatisfactory particularly for the novice schools in their initial effort. Computers are complex enough so that when problems arise, teachers and staff will have questions to ask. Also, when starting a new program, there should be assistance to the teachers directly and provision of inservice training.

1. Computer operators – The network center has the responsibility for running the computer, providing maintenance for it, loading programs and performing all the utility tasks that keep it running. In addition to the continuing responsibility to keep the system trouble free, there will undoubtedly be requests to make of the people at the central site. Thus the network should be able to provide assistance incldluing computer operators to handle routine requests, to tend the system and to take trouble calls.

2. Programmers – Assistance should also include professional level staff to write general purpose programs develop new programs and publications for the network, and to acquire materials from other sources. Computing instruction is expanding at a rapid rate throughout the country and much of the material produced by other computer projects can be useful to your program. Someone has to keep an eye on this field, to acquire the materials and if they are suitable for use to adapt them to the local system and make them available in general.

3. Resource persons – The network should also have a user relations coordinator to provide direct on-site assistance. This person should be available to give faculty and staff an initial orientation, and in general, to assist in training teachers. Also, he/she should be available for specialized workshops for groups of teachers in a specific study area. Finally, this person should act as liaison and facilitate communication. The cost for such services, if any, should also be clearly detailed.

C. Communication between users

Part of network operations should include good communications. The network should supply at least an initial set of manuals to its subscribers. These include both the computer manufacturer's reference manuals and any manuals that the network itself provides.

To keep its users informed, and to foster closer cooperation among the users themselves, a local network newsletter is a very worthwhile vehicle. Typically, network members can also subscribe to the computer manufacturer's newsletter for no charge. Both devices are invaluable in keeping posted on new programs, literature and teaching materials.

Meetings should also be held where teachers and others can gather periodically in order to exchange ideas, problems, information and programs. It would be to their advantage if the netowrk users were allowed and encouraged to organize an informal organization and to actively support it.

Vendor Stability and Commitment to Program Support

A statement of commitment to a full program of support and services should be available from a high level administrative officer of the organization which offers timeshared computer services. Generally speaking this commitment should emanate from the level of university chancellors or vice chancellors, CESA coordinators, etc. The stability of long range intentions is a factor in the decision process for the school district which wishes to evaluate a potential source of service.

computer nut

Between the stages of pre-calculation and scientific speculation you are bound to find yourself confronted by a Computer-nut.

Usually you can spot one a mile away, merely look for someone wearing sneakers and carrying a briefcase or deeply involved in writing a program on the backside of a flattened dixie cup.

But spotting a computer-nut is not easy for there are several varieties.

First there is the all-out total know-it-all programmer, he is the one with the buzz haircut and horn-rimmed glasses.

Then we find the computer fanatic, he feels that good manners should be used in the computer room at all times (so he can use the computer undisturbed) and force should be dispensed with, but force is the only thing that will get him off the terminal.

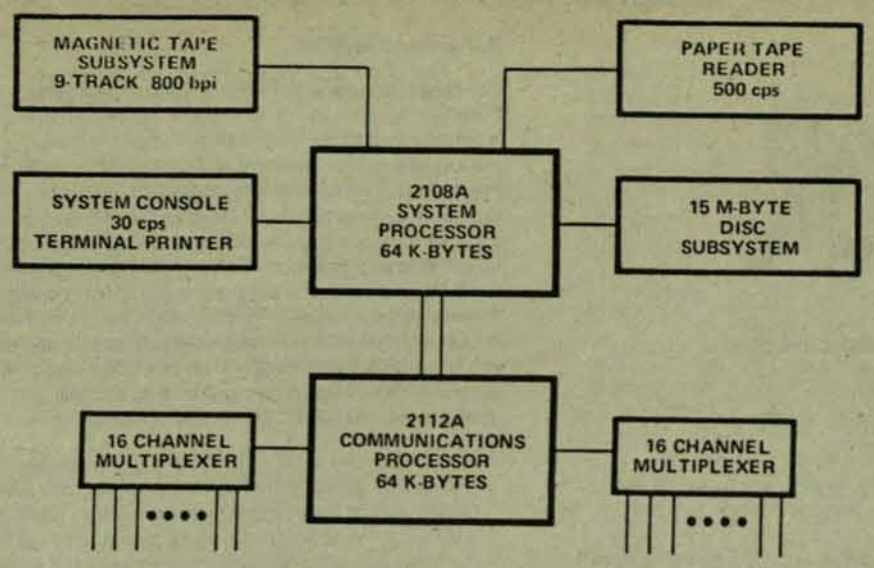
Then of course there is the honest computer nut, he is the one who feels guilty every time he breaks off a program.

Last, our No. 1 enemy, the computer-nut that puts in repeating joke programs with disabled break keys.

Whether you are one of these or not it does not matter for you are still a new breed clearly classified as a Computer-nut.

Randall Galliher
5910 White Cloud
San Antonio, TX 78238

1. Larger string capacity and additional string operations.
2. Facilities for the creation, deletion and manipulation of data files from a program.
3. Facilities for program access of peripheral devices such as magnetic tape, line printers and card readers.
4. Access to operating system services under program control.



HP 2000 ACCESS SYSTEM MODEL 40

You've heard about the new HP2000G? That's what everyone thought it would be called. Upon release, they changed the name to *HP 2000 ACCESS SYSTEM*. It's an improvement over the 2000F in three ways –

- It can act as a remote job entry terminal to any IBM system operating in HASP or a CDC system in their U200 concurrently as time share users run BASIC programs.
- *It allows all* users access to peripheral resources; card reader, line printer, paper tape punch, paper tape reader, magnetic tape unit.
- It has some nice enhancements to the BASIC language.

The HP2000/30 is a 16 terminal system with two HP*2100* processors, a 32K system for CPU and a 16K system for communications. For $59,960 it comes with a 5M byte disk, magnetic tape unit, and paper tape photo reader. This configuration will not operate on an RJE terminal without additional storage. in the processor unit.

HP2000/40 is the 32 terminal system which has 2–32K processors. It comes with a new 15M byte disk plus magnetic tape and paper tape reader. Yours for $67,600. Software to operate the RJE feature costs an additional $1000. (Upgrade *costs* from 2000F vary from $8500 to $11,500 depending on what configuration you have)

The BASIC language improvements include –

- UPS$ function replaces lower-case letters with their upper-case equivalents.
- POS function allows the scanning of a string for a particular substring, e.g. great for searching for a key word in a string.
- Number of string variables increased from 26 to 78 and the maximum length of each variable increased from 72 to 255 characters.
- CHR$ function returns a one character ASCII string when given the decimal number of the character. Any characters, even control ones, can be generated.
- CONVERT statement converts a string to a unique floating point number and vice-versa.
- NUM function returns a decimal number (0-255) equivalent to a supplied ASCII character. This is the reverse operation of CHR$ and allows the program to compare or branch on the value of a particular character.
- EXTENDED STRING LITERALS allows users to enter special ASCII control characters into a BASIC statement, e.g. output a carriage return to the terminal through the PRINT statement.
- CREATE and PURGE statements.
- FILE Command associates a file name with a peripheral device.
- ADVANCE statement allows skipping a number of items in a file.
- ASSIGN statement allows dynamic allocation of device in running program.
- UPDATE statement allows updating of a specific item in a record.
- REC and ITM allow determination of file pointer location by record and item number.
- LOCK/UNLOCK statements allow multiple users to cooperate in multiple write access to a file.
- READ, LINPUT and PRINT statements now allow accessing of peripheral devices.
- SYSTEM statement allows variety of operating system commands to be issued from a program.

OLD NEWS – The HP2000E 16 terminal system with 5M byte disk still runs $34,950. The 2000F, 32 terminal system with 5M byte disk now runs $63,500.

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Hewlett Packard
11000 Wolfe Road
Cupertino, Ca. 95014

HP 3000 COMING OF AGE

Is it ready for you?

It's hard to write about this system for any number of reasons –

1. Users are few, and finding *hard-core* information about the HP3000 is difficult.
2. HP literature, while clearly defining the hardware and software, does little to discuss terminal responses, disk vs core vs response time pay offs, etc.

With that disclaimer we proceed. This article is written based on heresay. We felt it absolutely essential to introduce the HP3000 as "its time has come" and its impact may be great in the "ed biz." None-the-less, we have many, many questions. If you have experience with the 3000, please, please write us a publishable letter describing your experiences.

The HP 3000 was announced some 3 years ago. It was hailed as the first multi-language, time-sharing system at mini computer prices! Time sharing and batch would run simultaneously with service to as many as 64 users. A new style architecture would support all this in just 96K bytes! From then on it was straight downhill. HP had a hell of a time delivering systems, let alone promises. After a year and a half of false starts, unhappy customers, and declining profits, the company essentially pulled the product off the market while the factory retooled, retrenched and reevaluated their product. Early systems would drive few terminals and they ran slowly. Any multi-language usage ground the system to a slow drudge 64 terminals was a fantasy, 32 a dream. The reality was 12–15 running slowly with, not 98K bytes, but 144 bytes.

The HP3000 has returned! And this time it seems to be real and here to stay. HP has developed 4 configurations each a "building block" expansion of a smaller configuration.

HP3000 Model 50CX

The smallest unit "for low cost terminal capability." A 96K byte system with 5M byte disc and magnetic tape unit. A 16 channel multiplexer is included for $99,500 total. Free software for this model is limited to a text editor (EDIT), HP's new compiler language SPL and some utilities. The system will run 4–5 terminals depending on the job mix.

Model 100CX

For $129,500 you get a more complete and more capable system. Still 96K bytes of memory, the Model 100 has a 15M byte disk, magnetic tape unit, card reader (600 CPM) and line printer (200 LPM) In the minimum configuration it will "support 4 to 8 terminals. With optional core expansion it can support as many as 16 terminals." You get the Model 50 software plus BASIC interpreter and BASIC compiler as part of a time share option for FREE. For $5000 you receive a Scientific Software Package which includes a FORTRAN compiler, scientific library, statistics package and other goodies. Presumably these can run simultaneously with other software. For another $5000 ($9000 for the two) comes an RPGII compiler plus goodies. Looks like a pretty complete system!

Model 200CX

This is "big brother" with bigger price, $171,000. It's 128K bytes is coupled with a 15M byte swapping disk to speed up responses plus a 47M byte moving head disk. To all the other goodies from Model 100, you can add a COBOL compiler as part of the $6000 Business package. This configuration *should* run 16 terminals with suggestions that more are possible.

Model 300CX

The top of the line features terminal and batch users with as many as 32 users. It's cheap for what it does when compared with what other vendors would require for BASIC, FORTRAN, RPG, COBOL, and a Data Base Management System, all operating at the same time. $203,500 which includes 128K bytes of memory, 15M byte disk, 47M byte disk, 1250 LPM printer and a card reader/punch system. Model 300CX is a 200CX with faster peripheral devices and a free data base management software system.

All HP3000's will run foreground and background jobs simultaneously – time queues can be set up on equal or unequal priority for 3 user types –

1 – timesharing
2 – batch
3 – "slop" . . . do it when you can!

The preceding 4 models are "packages" – actually, all software runs on all systems. You can run timeshare BASIC on the Model 50, however, slowly. You can run data base on the Model 200, etc. These packages are probably make *efficient* use of hardware. You must pay $$ for software that doesn't come with your model.

There is much much more to the HP3000 than these descriptions can offer. There are many payoffs keyed to your specific needs. HP now has software to do *school or college student recordkeeping and budget operations. If that's your application then your* configuration *will be far different than that of a* school devoting its system to student use only.

If you look at the 3000, move with caution, ask lots of questions, talk to people who own one and particularly talk to someone who's use is like yours. The HP3000 seems to have arrived but it's not as easy to buy as a simple BASIC timesharing system.

The HP 3000: What It Is & What It Ain't for Education

For educational application, the Palo Alto Unified School District has an HP-2000 and an HP-3000. The 2000 is used in elementary and secondary schools for BASIC programming, simulations in social studies and science, educational games, guidance counseling, and computer assisted instruction in language arts, math, foreign language and other subjects. The 3000 is used in the high schools for instruction in BASIC, FORTRAN, COBOL, SPL, and computer science. It is used primarily by the Math and Business Education departments, although it is also used for educational research and testing. The district will soon be using the 3000 for data processing, but more about that aspect later.

The Palo Alto schools' HP-3000 has 64K words of memory, an ISS disc of approximately 50 million bytes, a 7900A system disc, one 800 BPI tape drive, a 7260 optieal mark card reader (run through a terminal), and a Tally 200 LPM printer.

The district is fortunate in having the two computers because neither one alone would satisfy the needs of the district, even if either one were able to support the 48 terminals now in use. The 2000 is ideal for CAI because of its fast response time, but it is limited to BASIC only. It can only do batch processing when the time sharing system is shut down and a different disc operating system is loaded. To do so is time consuming and either eliminates all other users or must be done at night – an awkward situation in terms of personnel shift hours. As the computer center now operates, the HP-2000 is up on line with 32 ports 24 hours a day except for about one hour daily for backup. The 2000 has a surprising number of evening users – teachers doing their preparation, students doing CAI at the Children's Hospital, for example.

The HP-2000 has a relatively simple operating system. Using only the 2000 a student would learn little about computer shops using bigger and more complex computers. Conversely, the HP-3000, although a relatively inexpensive mini-computer, has a big computer-type architecture with a big computer-type operating system. Students trained as programmers or system operators on the 3000 make an easy transition to bigger systems. They learn to use sub-systems such as the text editor and the file copier. They learn other languages such as FORTRAN and COBOL that equip them better for jobs in certain applications.

The HP-3000 system is flexible; time sharing and batch processing can operate simultaneously, *but* there are trade-offs, given the fact that a mini-computer is trying to pretend that it's a big computer. Response time with only a few users is slow. CAI is an entirely inappropriate activity for the 3000. It can easily be overloaded, especially when compiling programs; with more than 12 interactive sessions, the machine slows down to a crawl.

Additional core and a fixed-head disc would improve performance to a marked degree. It is reported that without additional core, a fixed-head disc improves the efficiency from 20% to 30%. Additional core should bring the response time to a point comparable to the 2000.

As it is, considerable attention must be paid to tuning the performance to the needs of a particular installation. As the district faces bringing its data processing from a regional computing agency to the HP-3000, the district computer center has been and is experimenting extensively to refine that tuning. Obviously, the data processing must be scheduled to avoid impacting the educational applications. In addition, setting the quantum (the time slice given each time sharer) and relegating batch processing to a secondary queue improves the interactive response time. **The most effective tuning procedure is to spool all compiles, permitting them only to come out singly or at a time when the interactive load is low.** The district will be acquiring a new, faster moving head disc, which will enable the HP-3000 to support 20 ports with a response time at least no worse than it is now.

For the educational requirements the Palo Alto Unified School District makes of its HP-3000, it serves well. If it were the district's only computer, it could not meet the educational needs of the district. If such were the case, the HP-2000 would serve better as the sole computer, recognizing that it, too has its limitation.

Ernie Pope
Educational Technology
Palo Alto Unified School District
Palo Alto, Ca. 94306

IBM Wants You

by LeRoy Finkel

You may not have noticed but for 2½ years we've been writing about classroom computer hardware with nary a mention of the world's largest hardware manufacturer, IBM. Why? Because for 2½ years we didn't feel IBM had much to offer the classroom computer user, either in hardware or software.

This article represents a significant departure from past procedure but not a change in attitude. If your school, district, county, neighbor, friend, consortuim, etc., has an IBM 370 Model 125, 135, 145 or bigger, read on. This article will call to your attention what you can do to it to make it usable in your classroom. If there are no computers near you, but you're looking for an instructional computer system, go call your friendly DEC or HP salesman. . . they still have the best buy for you.

In talking with IBM we discovered two things –

1. *Big computers use a whole new jargon which* required a whole new learning process for us –
2. Simple, straight answers are hard to come by since there are a jillion different configurations for each IBM system.

IBM is unbundled and does not offer any time-sharing software for its systems – at least not down where your $ can afford it. They do recommend two sources to select from: WESTCHESTER BOCES of New York and McGill University, Canada.

BOCES BASIC

If you only need to talk BASIC and COURSEWRITER and you're near a 370/125 or larger, BOCES has a software package that may just be what you need. In COURSEWRITER they have written a BASIC translator that makes the user think she (he) is sitting at any normal time sharing terminal connected to any popular system. It provides line editing, error messages, plus all the language capabilities you are accustomed to. Our analysis of the BOCES BASIC language is that it looks like they took all the features of HP 2000 BASIC (good and bad), added a few APL functions plus a few other nice features. Programs are limited to 1000 statements with CHAIN available. They are continually upgrading the language and making additions and improvements.

What hardware do you need for BOCES BASIC? You need at least a 370/125 with 120K core plus some core for system overhead and 10–20 Mbytes of disk. If you want to run batch jobs in the background while time share runs in the foreground you'll need more core and more disk. One local district, San Mateo High School District, runs 14 TTY terminals in BOCES BASIC while running very small accounting jobs in the background. After school hours, San Mateo runs its regular school data processing jobs in the large partition that was used for time sharing. San Mateo estimates that the hardware required to run this time share system costs them roughly $30-35,000 more per year than the hardware necessary to run a straight batch DP shop. (Compare that cost to a stand alone system.)

BOCES BASIC has no real limit as to the number of terminals except core space and speed. San Mateo's 14 terminals run on a very small system. Response is alow when compared to an HP 2000 system but average when compared with other systems. The system is hampered by the fact that BASIC is simulated in COURSEWRITER requiring much system overhead and slow response times. Rumor indicates that BOCES BASIC will soon be available in machine code, reducing core requirements and increasing speed.

Costs – The BOCES BASIC software costs $1050 per year which sounds very reasonable. Add a $220 per month COURSEWRITER software fee and your total annual software charge is up to $3690. Buyer Beware – this software system is **not** supported by IBM. Software support comes from Westchester BOCES. They have done a nice job of cleaning up past bugs.

For more information –

Board of Cooperative Educational Services
Westchester County
Elmsford, New York

or

IBM

MUSIC

MUSIC – McGill University System for Interactive Computing.

We don't normally write about systems we haven't used but MUSIC seemed important for this article even though we haven't been able to arrange a hands-on demonstration.

Those of you who are accustomed to large scale time sharing systems will like MUSIC. It runs on nearly any IBM 360 or 370. A 240K system with 3–2314 disk drives or 2–3330 drives will support as many as 60 terminals. (384K will support 250 users.) Users can program in their choice of FORTRAN IV, ANS COBOL, Assembler F, BASIC, APL, Basic assembler and Basic FORTRAN. From what we can see the software "system" is as complete and thorough as you could possibly imagine. It includes a large Public Library of popular programs and various application packages developed by McGill or adopted from well known public domain packages.

A nice feature of MUSIC is that it can be one of many "jobs" running on your computer. Batch jobs could be running in the background while interactive users operate in the fore ground. Common files may be used by both batch and interactive users which opens up all types of interesting possibilities.

Our COBOL experts don't like the interactive COBOL because only fixed length sequential files can be used. However, for a teaching language or for small jobs, it looked good.

MUSIC BASIC looks like a full blown implementation of the language. The only serious defect we could see is that string variables are limited to 7 alphanumeric characters (subsequent software releases may have changed this). BASIC works with a compiler, not an interpreter or translator. That means that though you can call it "interactive" it doesn't 'interact' the way most time share users expect. To enter a program you follow these 3 steps:

1. Enter program using BASIC editor
2. Compile and check for errors
3. Execute compiled program

If errors are detected at step 2 or 3 you must return to the editor, change your program and then proceed to steps 2 and 3 again. Sounds easy but it does add some inconvenience for the new comer or occasional user who has to remember a more complex command syntax to get operational.

We've hear the following comments about MUSIC from users and friends of users –

- Great system. Teachers love it.
- With 30 terminals on a 370/135, it's really quite slow for students. They wait after they press RETURN!
- System software is solid.
- Installing the system is quick and clean.

When you ask IBM about MUSIC, they talk about systems in the 370/145 or bigger range even though the software does run on smaller systems. School users of MUSIC include Chicago School Board, Boston University, American University (Washington, DC) Boulder Valley Schools (Colorado) and Huntington Beach School District (California).

Costs – Buy MUSIC from McGill University and it will cost you $7000 to install and they send staff if you have difficulty bringing up the system. Annual charges thereafter are not clearly specified. Buy MUSIC from IBM and it costs $14000 and they provide "Level B" support (whatever that means). Hardware costs are nearly impossible to calculate. There are many, many payoffs to consider – most dealing with response time.

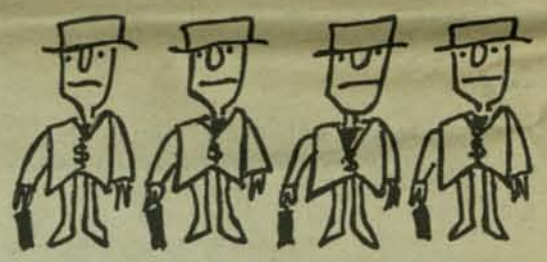
Some payoff questions include – will the system also be used for batch work?, how many terminals will be used? (MUSIC supports 60 – 250) how important is multiple language capability? To be sure, annual hardware charges for a MUSIC system will start at $150,000. The real question is, how much has to be added to an existing system to make MUSIC operational and that answer varies from system to system.

MUSIC is an alternative to consider. For more info contact –

McGill University
Montreal, Quebic
Canada

or

IBM



ALTERNATIVES

In an effort to compete with IBM's time shared offerings, DEC and HP have introduced hardware that will "talk" to most any IBM system. What they have done is made improvements to their regular time share hardware line to allow one channel to communicate to the IBM system on a remote job entry (RJE) basis. Any time-share user using the regular DEC or HP time share system can "que" his job so that at some point the information will be transmitted to the host IBM system. For those of you who talk in "IBM", the time share system emulates an IBM 2780 Data Transmission Terminal while still giving you all the regular time share capabilities.

Our local DEC representative priced an RSTS/2780 using a PDP 11/40 with 64K (words) core and 7.5M bytes of disk storage plus magnetic tape unit, RSTS software, 2780 hardware and software, at $86,000. This 32 terminal (31 time sharing, 1 RJE to IBM) system will cost $20640 or so per year on a lease purchase (you own it after 4-5 years) plus $8400 per year for maintenance.

HP's equivalent is the new HP2000 access system (see more on page 6). The model 40 drives 32 terminals in BASIC, more than one of which may be running RJE to an IBM system running in HASP operating system. Model 40 is $67,600 with 64K (words) of semiconductor, 15M bytes of disk, magnetic tape plus $1000 for all the software to do the RJE for a total of $68,600. Regular 5 year lease is $17,652/yr. (there may be an educational discount) plus $5856 per year for maintenance.

Classic Classic Classic

What's new from DEC—

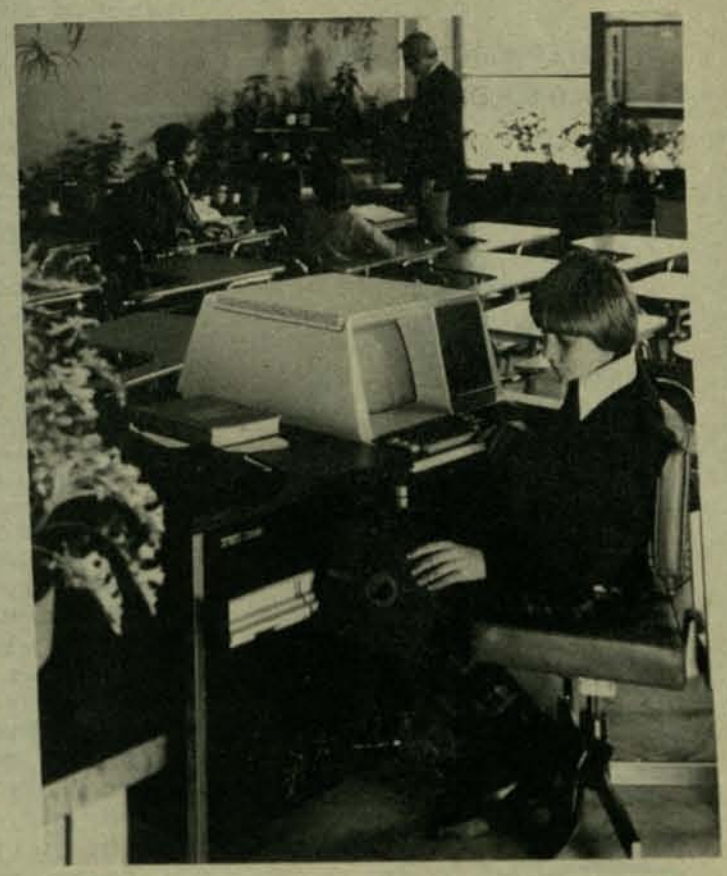
It's small. It's cheap (inexpensive). It comes standard with a CRT display terminal and printer. It includes dual "floppy" disks that hold 256,000 characters each. It talks in OS/8 BASIC. It's fast. It is sweet. It may even jump over tall buildings . . .

It's DEC's new CLASSIC (CLASSroom Interactive Computer). Built around a 32K PDP 8/E with dual floppys and a VT50 CRT/printer, this new system was designed with educators in mind. It's priced at $8900 or less than $200 per month on a lease. It weighs 150 lbs and DEC suggests that you roll it around from room to room!

The floppy disk makes it possible for each student to have his own cheap library of programs to carry around and easily plug into the system. With a little imagination, students could have their own operating system on a disk as well. DEC also provides a complete library of programs on floppy's — games, Huntington programs and regular public library materials.

DEC shipped a prototype CLASSIC around to sales offices for demonstration purposes. Our demo model was really beat up but we did get a feel for it. OS/8 BASIC is a BASIC compiler system. You do not get line by line error messages as you enter programs. You load, compile, run and then see your bugs. Those of you who are used to interactive BASIC interpreter will have to adjust to this system. But its so fast, the adjustment won't bother you.

The CLASSIC offers the educator some exciting new possibilities. If you're shopping for a single terminal system you must see this one (expansion to multi terminals is not possible... yet!). Of interest to you vocational educators, CLASSIC is being sold to businesses under the name Datasystem 310 for substantially more money. Also to engineers. Maybe you can justify its purchase for vocational purposes.



OMSI-RT Adds Multiple Languages to RSTS/E
ANSI FORTRAN IV and MACRO-11 Assembler

RELIABLE, POWERFUL, FAST, AND FLEXIBLE – COST IS $2350

FEATURES –

- RSTS/E users may enter RT-11 system to compile and run FORTRAN IV programs, assemble and run MACRO-11 programs, and use other PDP-11 languages.
- All users can switch at will between BASIC-Plus and RT-11 – all features of BASIC-Plus are retained.
- Standard DEC FORTRAN IV and MACRO-11 run unmodified under OMSI-RT.
- RT-11 computation speed can be 2 to 50 times that of BASIC-Plus.
- FORTRAN can read and write BASIC-Plus compatible files.
- Many advanced RT-11 features available including chain and overlay.
- System and other users are fully protected from RT-11 user errors.
- 28K word RT-11 jobs are possible depending on system capacity.
- RT adds only 4K words to resident RSTS code.

Strong Unconfirmed Rumors –

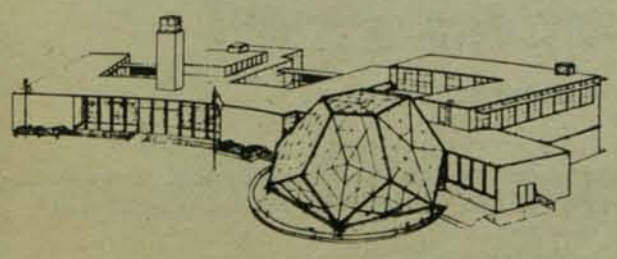
After two years of effort, the state colleges in California will award contracts for 19 interactive BASIC computer systems. Winning bidder is DEC RSTS/E on a PDP 11/45 mainframe.

LIMITATIONS –

- The RT-11 system requires more sophisticated users than BASIC-Plus.
- RT-11 real time and foreground/background are not available.
- Programs that do not use standard RT-11 I/O must be modified.
- Disks are the only file structured devices accessible under RT-11; other RSTS devices may be accessed as non-file structured devices under RT-11 or with BASIC-Plus utilities.

TRY IT NOW!

Call (503) 248-5900 or write for a demo account. OMSI's computer telephone is (503) 248-5961 available weekdays 8 a.m. to 6 p.m. After signing in, type "HELP RT11" for further instructions.



TO GET OMSI-RT –

You must have at least 48K words of memory; 64K is much better. Obtain the DEC binary licenses, software, and manuals for RSTS/E (version 5B or later) and RT-11 (include RT/FORTRAN if FORTRAN is desired).

OREGON MUSEUM OF SCIENCE AND INDUSTRY, 4015 S.W. CANYON ROAD, PORTLAND, OREGON 97221 (503) 248-5900

BIOSIN for a tiny EDUSYSTEM

- written in EDUCRUNCH BASIC
- by the OLD SOLDIER

Dear Dragonkeeper:

Here is my latest, best and hopefully last version of crunched BIOSIN, adapted to EDU20-C BASIC for an ancient PDP-8L with only 8K words of memory.

A word of caution. This would just barely fit in my 8K. As it was, most of the REM statements and explanation had to go. For these, refer to the Lawrence Hall of Science version in your earlier issues (PCC volume 3, number 2, pages 6 and 7.) Any brave programmer who wants to expand on them in 8K will have quite a problem.

Believe this should run on 8K Altair BASIC if backslash (\) is changed to colon (:) and LINPUT is changed to INPUT. Could perhaps run in 4K Altair BASIC if you could work it without strings, but that would be a job.

I would like to make one suggestion for others who submit programs. Please, even if you have a "super extended" BASIC, try to avoid using those functions not available to older and smaller machines except when they are absolutely essential to the execution of the program. Only in this way can we make our games and such, as widely available and useable as you would no doubt like.

On another point – I have been (I hope) substantially increasing my clout with public officials through the use of my computer. Almost any configuration can be easily programmed to write duplicate letters to multiple addresses. Business does it all the time. Whenever some action of our government grieves me, and this is quite often, I write one good letter, then plug in every public official remotely connected with the matter and let fly. Then I have a stiff drink or so.

Also, if anyone out there has a cheeep DECtape with control, out there in dragonland, let's haggle.

Sincerely,
The O.S.†

† old soldier

```
  1 REM "BIOSIN" BY LAWRENCE HALL OF SCIENCE, U OF CAL BERKELEY
  2 REM MODIFIED BY THE OLD SOLDIER FOR PDP8L, EDU20
 33 PRI"FOR WHOM IS THIS CHART?";\LINPUT Z$\Z=Z$(0)
106 FOR I=1TO7\READA$(I)\NEXTI
107 FOR I=1TO12\READA(I)\NEXTI
108 FORI=1TO12\READB$(I)\NEXTI
113 DEF FNY(Y)=29-SGN(Y/4-INT(Y/4))
115 DEF FNS(S)=INT(20*SIN((S/P-INT(S/P))*6.28318)+40.5)
117 DEF FNM(X)=INT(7*(X/7-INT(X/7))+.5)
159 PRINT " BIRTHDAY (MM,DD,YYYY)";\INPUTM,D,Y
163 Y=INT(100.1*(Y/100-INT(Y/100)))\IFM=1THEN174
165 A(2)=FNY(Y)
169 FOR I=1 TO M-1\D=D+A(I)\NEXT I
174 PRINT " PLOT STARTING DATE? (MM,DD,YYYY)";\INPUTM1,D1,Y1\D0=D1
177 Y1=INT(100.1*(Y1/100-INT(Y1/100)))
178 A(2)=FNY(Y1)
179 IF M1=1 THEN 189
181 FOR I=1 TO M1-1\D1=D1+A(I)\NEXT I
189 S=0\FOR I=Y+1 TO Y1-1\IF I/4=INT(I/4) THEN S=S+1\NEXT I
193 IF Y/4=INT(Y/4)  THEN S=S+1\IF D>59 THEN 197
195 S=S+((Y1-Y-1)*365)\S=S+(365-D)\S=S+D1
196 GOT200
197 IF Y/4=INT(Y/4) THEN S=S-1\ GOT195
200 D3=Y1*365+D1
203 FOR I = 1 TO Y1-1\IF I/4=INT(I/4)THEN D3=D3+1\NEXT I
206 PRINT" HOW MANY DAYS DO YOU WANT PLOTTED";\INPUTD9
209 D1=D0\GO SUB 300
211 PRI\FORI=1TO24\PRI"(*)";\NEXTI
213 PRINT"";TAB(30);"(-)      (0)      (+)"
214 FOR G=1 TO D9\E=FNM(D3-1)+1\PRI A$(E);\PRI D1;\IF Z<1THEN224
223 IF D1<> 1 THEN 226
224 PRINTB$(M1);\PRIY1;\Z=Z+1
226 IFA$(E)="SUN"THEN229
227 FORI=LEN(C$)+1 TO 63\C$(I,I)=" "\NEXTI
228 GOTO 230
229 FOR I=LEN(C$)+1 TO 63\C$(I,I)="-"\NEXT I
230 FOR I=1TO3\P=18+(S*I)\X(I)=FNS(S)\NEXTI
236 C$(40,40)="I"
237 C$(X(1),X(1))="P"
238 IF X(1)<>X(2) THEN241\IF X(1)<>X(3) THEN241\IF X(2)<>X(3) THEN241
239 C$(X(1),X(1))="*"\GOT251
241 IF X(1)<>X(2) THEN 244
242 C$(X(3),X(3))="C"\GOT245
244 IF X(2)<>X(3) THEN 247
245 C$(X(2),X(2))="*"\GOT 251
247 C$(X(2),X(2))="S"
248 IF X(1)=X(3) THEN 239
249 C$(X(3),X(3))="C"
251 PRITAB(14);\FORX=1STO63\PRIC$(X,X);\NEXT X
255 PRINT\D3=D3+1\S=S+1\D1=D1+1\IFD1<A(M1)+1THEN267
261 D1=1\M1=M1+1\IFM1<13THEN267
264 M1=1\Y1=Y1+1\A(2)=FNY(Y)
267 NEXT G
268 PRINT""
270 PRI\FOR I=1 TO 24\PRI"<*>";\NEXT I
272 FOR I=1 TO 10\ PRI\ NEXT I
277 DATA"MON","TUE","WED","THU","FRI","SAT","SUN"
278 DATA31,28,31,30,31,30,31,31,30,31,30,31
279 DATA "JAN","FEB","MAR","APR","MAY","JUN"
280 DATA "JUL","AUG","SEP","OCT","NOV","DEC"
281 END
300 FOR I = 1 TO 10\ PRI \ NEXT I
302 FOR I = 1 TO 72 \ PRI"*";\ NEXT I
304 FOR I=1TO5\PRI"P E O P H Y T H M   C H A R T";CHR$(13);\NEXTI
310 PRI\FORI=1TO4\PRITAB(4)"FOR";\NEXTI
311 PRI
312 FORI=1TO5\FORJ=1TOINT(Z/6+.9)\PRIZ$(J);\NEXTJ
313 PRICHR$(13);\NEXTI
314 Z=0
320 PRI\PRI\PRI
322 PRITAB(10);
326 PRI" YOU HAVE LIVED "S" DAYS AT THE START OF THIS PLOT."\PRI
328 PRITAB(10)CHR$(34);"P";CHR$(34);" STANDS FOR PHYSICAL CYCLE.";
329 PRITAB(57)"(23 DAY)"
330 PRITAB(10)CHR$(34);"S"CHR$(34);" STANDS FOR SENSITIVITY CYCLE.";
331 PRITAB(57)"(28 DAY)"
332 PRITAB(10)CHR$(34);"C";CHR$(34);" STANDS FOR COGNITIVE ";
334 PRI"(INTELLECTUAL) CYCLE.";\PRITAB(57)"(33 DAY)"
342 PRI
344 PRI"CRITICAL DAYS"CHR$(13);\PRI"CRITICAL DAYS:"
346 PRI
348 PRI"WHENEVER A CYCLE CROSSES THE MEDIAN LINE, THIS IS";
350 PRI" A ";CHR$(34)"CRITICAL DAY";CHR$(34);"," YOU ARE SUPPOSED ";
352 PRI"TO BE MORE PRONE TO ACCIDENTS ON THAT DAY SO BE CAREFUL!"
362 PRI\PRI\RETURN
```

```
*****************************************************************************
B I O R H Y T H M   C H A R T
    FOR
T H E   P. C. C.   D R A G O N


          YOU HAVE LIVED  16583  DAYS AT THE START OF THIS PLOT.

          "P" STANDS FOR PHYSICAL CYCLE.                  (23 DAY)
          "S" STANDS FOR SENSITIVITY CYCLE.               (28 DAY)
          "C" STANDS FOR COGNITIVE (INTELLECTUAL) CYCLE.  (33 DAY)


CRITICAL DAYS:

WHENEVER A CYCLE CROSSES THE MEDIAN LINE, THIS IS A "CRITICAL DAY", YOU
ARE SUPPOSED TO BE MORE PRONE TO ACCIDENTS ON THAT DAY SO BE CAREFUL!



(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)
                             (-)     (0)    (+)
TUE 15  JUL 75                      C P                  S
WED 16                             C     I    P            S
THU 17                          C        I         P      S
FRI 18                       C           I             PS
SAT 19                    C              I           S    P
SUN 20       --------C----------------I--------S---------P---
MON 21              C                 I   S               P
TUE 22             C                  S                  P
WED 23             C              S   I               P
THU 24              C         S       I            P
FRI 25               C     S          I       P
SAT 26                 *              I  P
SUN 27       -------S----C---------P--I----------------------
MON 28              S       C P       I
TUE 29             S      P    C      I
WED 30              S P           C   I
THU 31             PS                 C
FRI  1 AUG 75     P   S               I   C
SAT 2             P       S           I      C
SUN 3        -------P--------S--------I---------C------------
MON 4                  P          S   I            C
TUE 5                       P         S              C
WED 6                            P    I   S            C
THU 7                                 P        S        C
FRI 8                                 I    P      S      C
SAT 9                                 I         P     S  C
SUN 10       -------------------------I-------------P--SC----
MON 11                                I               CPS
TUE 12                                I             C    *
WED 13                                I           C     SP
THU 14                                I        C       SP
FRI 15                                I     C        *
SAT 16                                I C         SP
SUN 17       -----------------------C-I-------PS--------------
MON 18                             C     I  PS
TUE 19                          C     P  S
WED 20                       C   P   S   I
THU 21                    C P   S        I
FRI 22                   CP   S          I
SAT 23                 *  S              I
SUN 24       -----*- S---------------I----------------------
MON 25            *S                     I
TUE 26           SCP                     I
WED 27             SC  P                 I
THU 28              S C     P            I
FRI 29                S C        P       I
SAT 30                    SC             P
SUN 31       ----------------S- C-----I----P------------------


<*><*><*><*><*><*><*><*><*><*><*><*><*><*><*><*><*><*><*><*><*><*><*>
```

The OLD SOLDIER, now semi-retired, whiles away the hours crunching BASIC programs into his tiny PDP-8L. If you have a tiny EDUSYSTEM, send crunched programs to the Old Soldier, c/o PCC, P. O. Box 310, Menlo Park, Calif. 94025.

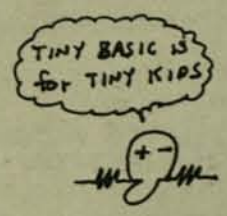
Build Your Own BASIC ~ Revived

WHAT IS TINY BASIC???

TINY BASIC is a very simplified form of BASIC which can be implemented easily on a microcomputer. Some of its features are:

Integer arithmetic 16 bits only

26 variables (A, B, . . ., Z)



Seven BASIC statements

INPUT	PRINT	LET	GOTO
IF	GOSUB	RETURN	

Strings only in PRINT statements

Only 256 line programs (if you've got that much memory)

Only a few functions including RND

It's not really BASIC but it looks and acts a lot like it. I'll be good to play with on your ALTAIR or whatever; better, you can change it to match your requirements and needs.

TINY BASIC LIVES!!!

We are working on a version of TINY BASIC to run on the INTEL 8080. It will be an interpretive system designed to be as conservative of memory as possible. The interpreter will be programmed in assembly language, but we'll try to provide adequate descriptions of our intent to allow the same system to be programmed for most any other machine. The next issue of PCC will devote a number of pages to this project.

✱ In the meantime, read one of these.

Compiler Construction For Digital Computers, David Gries, Wiley, 1971
493 pages, $14.95

Theory & Application of a Bottom-Up Syntax Directed Translator
Harvey Abramson, Academic Press, 1973, 160 pages, $11.00

Compiling Techniques, F.R.A. Hopgood, American Elsevier, 126 pages
$6.50

The TINY BASIC proposal for small home computers was of great interest to me. The lack of floating point arithmetic however, tends to limit its usefulness for my objectives.

As a matter of a suggestion, consideration should be given to the optional inclusion of floating point arithmetic, logarithm and trigonmetric calculation capability via a *scientific calculator chip interface.*†

The inclusion of such an option would tend to extend the interpreter to users who desire these complex calculation capabilities. A number of calculator chip proposals have been made, with the Suding unit being of the most interest.

Thank you for the note of 13 June, regarding my letter on the Tiny BASIC article (PCC Vol. 3 No. 4). It was with regret that I learned that the series was not continued in the next volume. Even though few responded to the article published, conceptually the knowledge and principles which would be disseminated regarding a limited lexicon, high level programming language are of importance to the *independent* avocational microcomputer community.

At this time, PCC may not have a wide distribution in the avocation microcomputer community. This could be possibly the cause for the low number of respondies. Never the less, this should not detract from the dissemination and importance of concepts and principles which are of significance.

The thrust of my letter of 15 April, 1975, was to suggest a mechanism for the inclusion of F.P. in a limited lexicon and memory consumptive BASIC. I hope that the implication that F.P. must be included was not read into my letter.

It is my interest that information, concepts and the principles of compiler/interpreter construction as it related to microcomputers be available to the limited budget avocational user. The MITS BASIC, which you brought up, appears from my viewpoint to be a *licensed*, blackbox program which is not currently available to: (a) 8008 users, (b) IMP-16 users, (c) independent 8080 users (except at a very large expense) or (d) MC6800 users who will shortly be on line.

Presently it appears that microcomputer compiler interpretor function langauges will be coming available from a number of sources (MITS, NITS, Processor Technology and etc.). However, few will probably deal in the conceptualizations which are the basis of the interpreter. Information which will fill the void in the interpreter construction knowledge held by the avocation builder, should be made available.

I strongly urge that the series started with Vol. 3 No. 4 article be continued. Possibly the hardware, peripheral, machine programming difficulties incurred by the microcomputer builder, is prohibiting a major contribution at this time. However, I would expect that by Autumn a number of builders should have their construction and peripheral difficulties far enough along to start thinking about higher level languages.

The previous objective for the article series sounds reasonable. It was not my purpose in submitting the letter to detract from the objective of a very limited lexicon BASIC, ie., to be attractive and usable by the young and beginner due to its simplicity.

If wives, children, neighbors or anyone who is not machine language or programming oriented is expected to use a home-base unit created under a restrained budget a high level language will be a necessity. It is with this foresight that I encourage the continuance of the "Build Your Own BASIC" series.

This issue aside, I would like to encourage the PCC to continue the quite creditable activities which have been its order of business with regard to avocational computing.

Michael Christoffer
4139 12th NE No. 400
Seattle, Wash. 98105

† For information on the calculator chip interface, write to: Dr. Robert Suding WOLMD, The Digital Group, P. O. Box 6528, Denver, Co. 80206.

Thanks for starting the series on building your own BASIC. This should prove very useful once the software limits have been established and the details start to come. There should be enough design information presented so that the techniques could be adapted to any computer.

Has anyone any recommendations for books or articles on designing assemblers, interpreters or compilers for minicomputers or microcomputers? I'm looking into the two mentioned on page 7 of the last issue. Are there any others?

R.E. Smallwood
20 – 12 St. N.W.
Calgary, Alberta, CANADA
T2N 1Y3

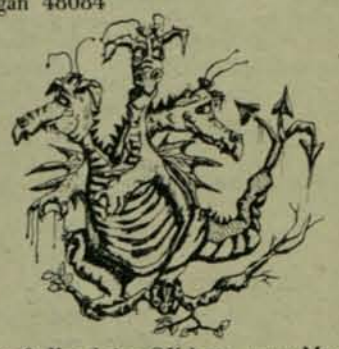
Just received the last issue of Vol. 3. What happened to "Write Your Own BASIC?" I sure was looking forward to it. I have –

Altair 8800 (256 bytes)
TVT I
Logiport I CRT terminal with modem.

I'm busy typing up a master for a 2K 2102-2RAM memory board for the Altair right now. Next is an I/O card.

I would think that learning to write an interpreter or translator would be invaluable experience to any computernik, whether his interest is software, hardware, or merely operating an existing system. Later, this year I hope to get the Altair programmed to do some amateur astronomy calculations and table look ups. It would be very handy to get real-time printouts of the positions of major celestial objects for any observer latitude, longitude etc.

Jonathan E. Tyler
5625 John R. Road
Troy, Michigan 48084



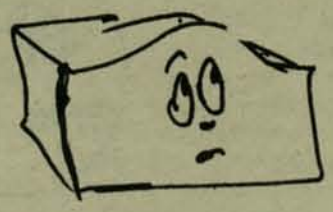
How's it going? I'm doing OK here, every Monday nite I get my mitts on a terminal, so I play around with games, algorithms, and such stuff. I'm getting into BASIC, and except for matrices, I think I know it pretty well. I really don' think I can use that new book of yours, since you chopped out the listings for some programs, and frankly the long ones are the ones where I need the game the most as I could write the smaller ones myself.

I liked the article on chips. Tiny BASIC looks to be pretty good. I might buy an Altiar 8800 if there is some simple way of getting a BASIC interpreter for it. That was pretty funny, the comment by my last letter in the paper, but not nearly as good as the excerpt about the Unknown Glitch.

Steve Follmer
623 Coram Rd.
Huntingdon Valley, Pa. 19006

The Mysterious and Unpredictable RND — Interlude

RANDOM NUMBER GENERATOR FOR THE INTEL MICROPROCESSORS



A Discussion by Gordon French

The Computer Hobbyist had Jim Parker's random number generator listing for the 8008. I entered it directly from the magazine, called it as a subroutine, and it coughed up all the random numbers that I cared to look at. The routine is very fast for the 8008, delivering about 300 random numbers per second. It is even faster for the 8080, though the version that I give here is only one byte shorter in length.

To use this routine, you call it as a subroutine. It returns the random number as a value in the range 000 to 255 (decimal) in the A register. This could be viewed as a value in the range +127 to −128 (decimal) if you care to look at it in that way. I have given it here in both codes, so that you can ke-switch it in in absolute if you haven't gotten your I/O boards from MITS yet.

There is one ugly about the routine, and that is that it will start to deliver numbers that are the result of having massaged the four bytes starting with location "shift". Nothing wrong with that, except that if you want the routine to begin with a different random number each time the program is loaded for execution, you must reach in and change one of the four bytes, or it will always generate the same random string for you. I'll leave you to figure out ways to make this routine generate random numbers randomly.

One way that I played with it was to set up a loop to call for a number, then check it to see if it was an ASCII code (i.e., 060 [octal] to 071 [octal]) and if it was, I printed it, counted it and inserted a carriage return and line feed if I had gotten to a count of 72 of the little devils.

I have located it absolutely at location 100 for my convenience. Those of you with a system that will allow you to enter it in mnemonics can relocate it where ever you like. In any event it will be easy to relocate since there are only a couple of references to hard addresses and the rest of it is all register to register.

One friend of mine commented that the 8080 version should be a lot shorter than the 8008 code, and wondered aloud if I had done something wrong. I told him that I wanted to exactly parrallel the two listings, but that in any even there would not be more than a couple of bytes difference because the two machines both handle their registers in very similar fashion, and differ more where jumps and calls are used. But in this case there is very little difference even if you shortened the 8080 code where you could. It is in any event, an object lesson for the brave souls who continue to work with (as I do) an 8008.

Those of you who plan to work up some computer games in assembly language may want to clip out this routine and save it until the need for a random number generator comes up.

JIM PARKER'S RANDOM NUMBER GENERATOR ROUTINE
FROM "THE COMPUTER HOBBYIEST" (VOL.1 NUMBER 5)

8080

```
000100/ 041 LXI, SHIFT+3
000101/ 145
000102/ 000

000103/ 006 MVI,B,8
000104/ 010
000105/ 176 MOV A,M
000106/ 007 RLC (TAG-RTOP)
000107/ 007 RLC
000110/ 007 RLC
000111/ 256 XRA,M
000112/ 027 RAL
000113/ 027 RAL
000114/ 055 DCR,L
000115/ 055 DCR,L
000116/ 055 DCR,L
000117/ 176 MOV A,M
000120/ 027 RAL
000121/ 167 MOV M,A
000122/ 054 INR,L
000123/ 176 MOV A,M
000124/ 027 RAL
000125/ 167 MOV M,A
000126/ 054 INR,L
000127/ 176 MOV A,M
000130/ 027 RAL
000131/ 167 MOV M,A
000132/ 054 INR,L
000133/ 176 MOV A,M
000134/ 027 RAL
000135/ 167 MOV M,A
000136/ 005 DCR,B
000137/ 302 JNZ,RTOP
000140/ 106
000141/ 000
000142/ 311 RET
(TAG THE NEXT LOCATION "SHIFT")
000143/ 123 SET TO ANY VALUE
000144/ 123 SET TO ANY VALUE
000145/ 123 SET TO ANY VALUE
000146/ 123 SET TO ANY VALUE
```

8008

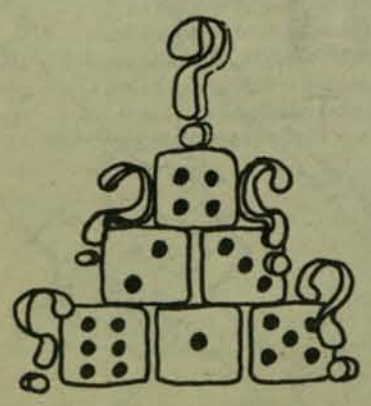
```
000100/ 056 LMI 000
000101/ 000
000102/ 066 LLI 147 SHIFT+3
000103/ 147
000104/ 016 LBI 010
000105/ 010
000106/ 307 LAM
000107/ 002 RLC
000110/ 002 RLC
000111/ 002 RLC
000112/ 257 XRM
000113/ 022 RAL
000114/ 022 RAL
000115/ 051 DCL
000116/ 051 DCL
000117/ 051 DCL
000120/ 307 LAM
000121/ 022 RAL
000122/ 370 LMA
000123/ 060 INL
000124/ 307 LAM
000125/ 022 RAL
000126/ 370 LMA
000127/ 060 INL
000130/ 307 LAM
000131/ 022 RAL
000132/ 370 LMA
000133/ 060 INL
000134/ 307 LAM
000135/ 022 RAL
000136/ 370 LMA
000137/ 011 DCB
000140/ 110 JFZ 000107
000141/ 107
000142/ 000
000143/ 007 RET

000144/ 123 SET TO ANY VALUE
000145/ 123 SET TO ANY VALUE
000146/ 123 SET TO ANY VALUE
000147/ 123 SET TO ANY VALUE
```

I ENTERED THIS ROUTINE STRAIGHT FROM THE MAGAZINE AND IT WORKS BEAUTIFULLY. "TRY IT YOU'LL LIKE IT". FOR MORE INFORMATION, READ THE ARTICLE THAT THE COMPUTER HOBBYIST PUBLISHED. THEIR ADDRESS IS:

THE COMPUTER HOBBYST
BOX 295
CARY, NC. 27511

I'M HOPING THAT THE GUYS IN CARY COME UP WITH A LOT MORE OF THIS KIND OF THING. I USED IT AND ENJOYED DINKING WITH IT. IF YOU HAVEN'T READ THEIR SHEETS, BETTER GET IN LINE.

MANY THANKS TO THEM FOR LETTING BOB ALBRECHT PUBLISH THIS PLAGERIZED VERSION OF A GOOD PIECE OF WORK. ALSO MANY THANKS TO ED HALL WHO CHECKED OUT THE 8080 CODE FOR ME.



SOLDERING?

It's not the only way.

BY ROBERT MULLEN

Hand soldering is a quick, easy and effective method for connecting conductors. A well made solder connection is neat, strong and has a very low electrical resistance. P C boards and most kits require soldering. Machine soldering of P C boards is very popular for large volume production, but soldering makes circuit changes and re-use of the components difficult. Heat from soldering can damage components and construction is slow.

The main alternatives to soldering are socket strips and wire wrap. Socket strips are plastic boards with small sockets on a 1/10 inch grid. The sockets are bussed together to allow the rapid connection of DIP and other standard components. Jumpers are made from stripped solid hook up wire, usually no. 22 AWG. The wire is pushed into a socket to make the connections.

Socket strips are made in sizes which range from one which holds a single 14 pin DIP to large assemblies capable of holding several hundres components and furnishing regulated power, signal generation, switches, indicators, etc. They are generally used for circuit development as they are not easily adapted to building multiple copies or connectors to other equipment.

They are initially expensive but allow repeated use of and do not damage the components; you can even save and re-use the wire jumpers. This makes socket strips ideal for educational use where many circuits are to be studied.

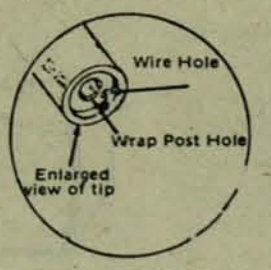
A couple of places to write for catalogs:

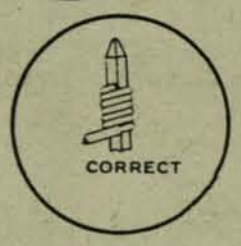
Continental Specialties Corp.
Box 7809
San Francisco, Ca. 94119

A.P. Products Inc.
Box 110
Painesville, Ohio 44077

Wire wrap was developed in the 1950's by Bell Labs as an alternative to soldering. Wire-wrapping consists basically of winding a number of turns of wire around a metal post with at least two sharp edges. In practice, the metal post has evolved into a standard 0.025 inch square pin. With the correct wire and tension during wrapping, a clean metal-to-metal contact results. The corrosion resistance, mechanical stability and conductivity are good enough for the technique to be used in military equipment.

Wire-wrap is widely used in industry for proto-type work and, using semiautomatic and automatic machines, for short run production. Wide usage has brought with it a broad range of hardware such as tools, DIP sockets, edge connectors, and even whole logic boards.





A wrapping tool is a pencil sized shaft with two holes in the end. The larger hole fits over the wrap post; the smaller hole fits over the wire. Wire sizes are 26, 28, and 30 guage. The tool can be turned by hand, or there are a variety of power drives available. For production work electric and pneumatic tool drivers are common. In proto-type work, battery powered drivers avoid the inconvenience of a trailing cord.

To make a wrapped connection the wire is stripped back far enough to give at least 6 complete turns, the end of the wire is put in the wire hole of the tool up to the insulation, and the tool is slid over the post and rotated. The first couple of turns are made with no downward pressure and with the free end of the wire held securely. When the wire catches on the post, pressure is applied. The correct pressure will result in a wrap with the wire tightly wrapped about the post. Too much pressure and the wire will wrap over itself, too little and the wire will spiral up the post. It takes a little practice to develop the feel to produce the correct wrap.

EXAMPLES OF INADEQUATE WRAPPED POSTS

POWER WRAPPING TOOL P160-4

Wire-wrap is best applied to making equipment to be used. The variety of hardware available makes connecting to existing equipment easy. Wire-wrap can be converted to hybrid P C boards, with power, ground, connectors and any stable circuitry on copper and circuits still under development in sockets and wire-wrap.

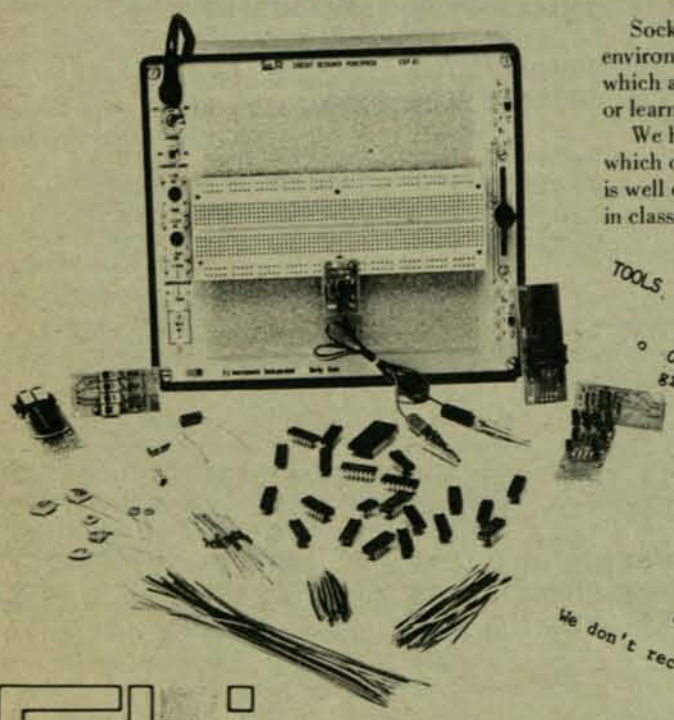
Wire-wrap tools have been unbelievably expensive, but an excellent battery powered wrapping tool at a hobbyist price, can now be had from:

$41.95

Godbout Electronics
Box 2355
Oakland Airport, Ca. 94614

Another supplier of wire-wrap tools:

O K Machine and Tool Corp.
3455 Conner St.
Bronx, N.Y. 10475



Socket strips allow assembly and disassembly of circuits – exactly what is needed in a teaching environment. E&L Instruments have used this ability as the basis for a teaching system – and one which according to a very reliable source, is probably the best package on the market for teaching or learning digital logic.

We have just received a set and can see what he means. Not only is there a wealth of experiments which can be performed, but the profusely illustrated text which came with it (almost 1000 pgs.) is well enough written to be even useable as a self teaching course. Bob Albrecht will be using this in classrooms this fall. Expect an article on his experience around December.

TOOLS

the RUGBOOK

° Only three tools are really necessary for all of the experir given in this laboratory workbook,

a pair of pliers [We currently prefer the XCELI chain nose plier with spring, No. 72CG.]

a screwdriver [Any inexpensive screwdriver tha approximately 4" to 5" long and has a tip width 1/8" or a little less is quite satisfactory.]

a wire stripper/cutter [We prefer the XCELITE wire stripper/cutter, No. 101-S.]

We don't recommend that any other tools be purchased.

Will the circuit given below "debounce" a SPDT microswitch? If the answer is yes, please explain in full detail how the circuit works.

Think of a Number

by SIVASAILAM THIAGARAJAN

NUMBER OF PLAYERS: Three or more. Five or six make the best game.

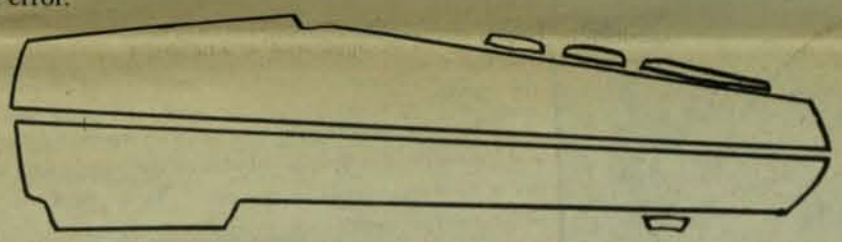
APPROXIMATE TIME REQUIREMENT: Depending upon the endurance of the players, one to five minutes. Game is replayed with different players assuming the role of the storyteller.

SKILLS INVOLVED: Basic arithmetic operations, solving equations involving a single unknown quantity, and making inferences.

CHANCE FACTOR: None.

PRELIMINARIES: Before the play of the game, one player is chosen to be the storyteller. Since a complete round of games involves every player in this role, it does not matter how the first storyteller is selected. During subsequent rounds of the game, players take turns assuming this role.

In spite of its apparent simplicity, this game lends itself to all sorts of ingenious strategies. Each round of the game has a player in the role of the storyteller who selects a single-digit mystery number. He keeps manipulating this number by adding, subtracting, multiplying and dividing it by other numbers. He tells the others what number he is using and what he is doing with it. But he never reveals the results. Other players attempt to keep pace with him until their information-processing mechanisms can hold no more. They individually ask the storyteller for a peek at the display and try to trace back the original mystery number. If successful, the player's score is the number of rounds he has endured. The object of the game is to outlast the other players without making an error.



PLAY OF THE GAME:

1. The storyteller selects a single-digit mystery number and punches it into the calculator. She also locks it up in the memory of the calculator if there is one. If not, she writes it down secretly on a piece of paper.

Charlotte selects 7 as her mystery number.

2. The storyteller now performs a series of steps with this mystery number. During each step she may add, subtract, multiply or divide using any single-digit number. She has to make sure that the results of these operations are never negative, fractional, or greater than 50. Nobody sees what the storyteller does on the calculator or the partial results on the display. However, she informs the others exactly what number she is using and what she does with it. She also keeps count of the number of steps taken. Other players try to keep track of what is happening to the original number.

These are Charlotte's statements as she manipulates the mystery number 7. "Step 1. I am adding 9 to the number." She gets 16 on the display. "Step 2. I am subtracting 2." This is a wasted move. She gets 14 on display. "Step 3. I am dividing by 7." This is a strategic blunder as you may have figured out already. The display now read 2. "Step 4. I am multiplying by 3." The display now reads 6.

3. Each player keeps track of the various changes in the mystery number as long as he can. He may stop the storyteller anytime he is ready to quit. The storyteller shows him, and only him, the number on display. The quitting player now has to retrace the mystery number and secretly reveal it to the storyteller either by writing her a confidential note or by whispering into her ear. If the mystery number is correctly guessed, the player gets a score equal to the number of steps taken so far. If incorrect, he scores a zero.

As Charlotte works through her story, here's how different players keep track of her moves: Thiagi, who is not very mathematical and has not played this game before, keeps mumbling to himself, "Add 9, subtract 2, divide 7, multiply 3..." Harold, who has taught math for three years uses an algebraic approach and stored the information thus: "X... X plus 9... X plus 9 minus 2. That's X plus 7... X plus 7 divided by 7. The whole thing's divided by 7... The whole thing's multiplied by 3 now. That makes it 3/7 times X plus 7..." Lucy, who loves numbers, starts out the same way Harold did. However, in step 3 when Charlotte divides by 7, her analytical brain functions this way: "The mystery number is less than 10. It has 7 added to it and is divided by 7. It still remains a whole number. So it could only be 7 in the first place!" Since she has discovered the myster number itself, she doesn't have to listen to Charlotte's story any more.

After step 4, Thiagi could not hold his chant any longer and he says, "I'm ready to quit." Charlotte shows him the 6 on display. Thiagi now does all the operations according to his chant, but in the reverse order and in the inverse fashion. In other words, he divides 6 by 3, multiplies the result by 7, adds 2, and subtracts to get the original mystery number of 7. This is hard work and he could have goofed almost anywhere. However, his luck holds out and he whispers the correct answer to Charlotte. She confirms the answer and awards him a score of four points.

Charlotte continues her story for the benefit of the other two players: "Step 5. I am adding 3." Harold loses his concentration now. The last thing he remembers is 3/7 times X plus 7. He now thinks, "3/7 times X plus 7 plus 3. That makes it 3/7 times X plus 10. As you can see he makes an error here: The equation should have been (3/7(X + 7)) + 3; Harold decides to quite and asks Charlotte for the display. He sees the 9 and tries to get back to the mystery number by solving his equation for X. He does this correctly but since his equation was incorrect gets a funny result of −2.33. Charlotte gives him a score of zero.

4. Anytime during the game a player may say "I want to go blind" and reveal the mystery number without looking at the display. This gives him an automatic score of 20 points.

Lucy could have done this before but she did not want to alert the others to the fact that there is enough information to infer the original number. Now that everyone else has dropped out of the game, she triumphantly reveals 7 as the mystery number. Since she is absolutely correct, she scores 20 points immediately.

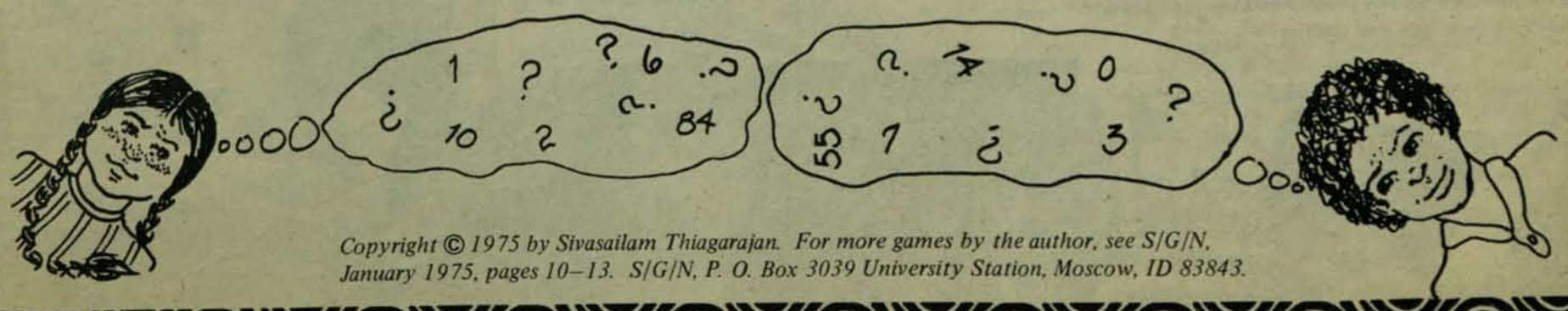
The game is repeated with Thiagi assuming the role of the new storyteller.

VARIATIONS:

1. During the first two or three times the game is being played, permit players to use paper and pencil. It still permits all sorts of strategy.

2. To compensate for discrepancies in mathematical competencies, players may set up minimum number of steps for each. Thus among the players in our sample game, Lucy may have a minimum of 5, Harold a minimum of 2, and Thiagi no minimum. A player's score will be the number of steps beyond this minimum.

3. With children, the game may be limited to addition and subtraction.



COMMUNITY MEMORY

KEN COLSTAD &

ABSTRACT

For the last year the Community Memory Project has been demonstrating the potential of computer-based *public access* communications media with a small network of public terminals in the San Francisco Bay Area. From any terminal it was possible to search a common data base using boolean combinations of keywords or to add and index new information/messages of whatever nature the user desired. Both the ease with which the public accepted the service and the imaginative uses to which it was put were surprising and gratifying. The project is currently developing hardware and software systems to move the idea from an externally financed experiment to a cheap, self-sufficient service available in all the neighborhoods and to all the cultures of the Bay Area. These systems would supply the basic tools for establishing similar services elsewhere, and provision is being made so these regional networks could be linked to form a continental information sharing network. It is hoped that the project will serve as an inspiration for using the computer technology to meet real human needs rather than to make money.

After twenty-five years of computer development, the question is still open as to whether this technology can be directly useful to the public. People at present generally believe that computer systems are used on them rather than for them. Could computer information systems be accepted and used by the public? In most information-handling systems, people have no control over the way data about them are acquired and used. Information in these systems is used for monitoring of people by institutions, and is often regarded as useful if it is negative.

The few public-access systems are vertically organized, conceived primarily for delivery of computer-aided instruction and other pre-selected information, as thoroughly editted as in other forms of mass communication. The possibilities of horizontal, person-to-person data acquisition and delivery have not been explored.

Such a horizontal system would allow the public to take advantage of the huge and largely untapped reservoir of skills and resources that resides with the people. One-to-one communications media such as telephones and letters create no new links, while one-to-many connections such as television, newspapers and bureaucracies inevitably restrict the flow of information through their offices. Since political and economic power follows the lines of communication, the potential for abuse is tremendous. A large pool of information, freely accessible and amendable through public terminals, is one of the few systems proposed for many-to-many communications.

A critical context for use of such a system would be in community based information centers rather than terminals located only in private homes. This might counteract the tendencies toward fragmentation and isolation so visible in today's society by significantly augmenting environments where small groups of people congregate and interact on an informal basis.

For the past year the Community Memory project has been demonstrating the potential of computer-based public access communications media with a small pilot network in the San Francisco Bay Area. From three publically located terminals it was possible to search a common data base for information or to freely enter new information or messages. The public accepted the service with remarkably little hesitation and put it to a much broader range of uses than was anticipated, proving that given the tools, the public will not only provide for its own information needs but will do so with great creativity.

This was a crucial question for the organization which spawned the system. Resource One, Inc. of San Francisco is one of the few public service computer centers in the country, a non-profit corporation devoted to charitable and educational uses of data-processing technology. Resource One had available an XDS-940 timesharing computer and ROGIRS, an efficient keyword based text retrieval package based on the MIRS system developed by Robert Shapiro of META. The software was modified to simplify the command structure for public use and to improve the security of the data and of other system users.

To use Community Memory, the user would type the command ADD, followed by the text of the item, and then by any keywords under which he desired the item to be indexed. To search for an item, the user would type the command FIND followed by a logical structure of keywords connected with AND's, OR's and NOT's.

The first port to this system was installed without fanfare adjacent to a bulletin board in a non-profit community record and music store in Berkeley. People were delighted by the chance to put a computer to use, frequently commenting that "it's about time!" They encouraged their friends to use the system, instructed one another in its use, and seemed fascinated as much by the possibilities of the medium as by the technology itself. This level of acceptance was not confined to the relatively sophisticated student area, but carried over to later installations such as one at a library in San Francisco's polyglot Mission District.

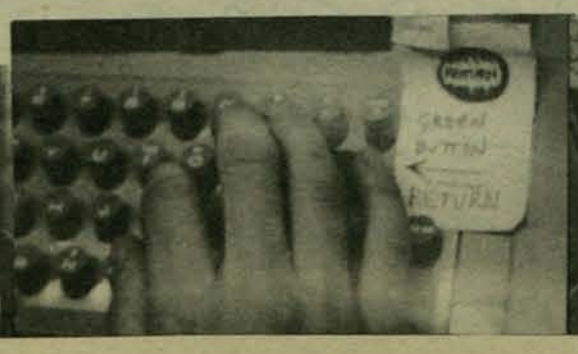
Initially the location of the terminal and its popular characterization as an 'electronic bulletin board' determined the public's expectations and uses of the system. Installed during the August housing crunch, it became immediately useful in the students' searches, with the rate of success growing with the size of the data base. Musicians, always in search of others with whom to practice, entered themselves and their special areas of interest. Instruments were bought and sold, producers found new opportunities, and groups advertised their availability. New groups, in fact, were often assembled on the spot from leads found in the data base, and from people waiting around for their turn to use the terminal. Similarly, people used it to assemble car pools, organize study groups, find chess partners, and pass tips on good restaurants. Interesting and unanticipated uses developed: poems, graphics, dialogues among strangers, and items most analogous to letters to the editor, but much freer in content and form: instant publication by a 'very small press' had become available to all who claimed literacy.

The rate of use of the system was fairly high and constant in relation to the environment of the terminals. About fifty searches and ten additions occurred each day at each location. Given the length of individual sessions with the system, this was at least one-third the maximum capacity of a terminal.

The crucial factor in determining the manner in which the system was being used was the rate of success, which in turn was determined by the data density for each subject area. A bootstrapping effect brought the density up slowly to a critical level, after which usage rose rapidly to a maximum level for that application. This critical level was never reached for certain roles in which the system would be uniquely valuable, such as a skills bank, learning exchange, forum for ad hoc organization, or barter marketplace. *Since no institutions have filled these information needs, they are not generally expected to be met, but a significant* number of users independently innovated these applications of the system.

The bootstrapping principle was self-evident in operation, and a number of individuals stimulated the process with bulk entries in their own special interest areas. These gratuitous offerings of information contributed strongly to the richness, diversity, and utility of the data base. Information degrades, however, and the responsibility felt by these users for maintenance and updating could not be effectively dealt with or assessed. To safeguard against unilateral censorship or destructiveness, the public had no editing privileges, although a number of people clearly could have been trusted to shepherd parts of the data collection. The system provided for maintenance by requesting a deletion date at the time of the addition, but this proved inadequate for all but the most 'classified ad' type of entry.

Malicious and obscene items, trivia, and misinformation represent the major opportunities for abuse of the system. In practice this kind of misuse was not prevalent, but scanning for it increased the maintenance responsibilities of the pilot project staff. An attitude of 'caveat emptor' has been advocated in this regard, since the content and relevance of the items the user finds can never be guaranteed. The editorial processes that have evolved in other media are not completely successful in this context, nor are they readily transferable.



EFREM LIPKIN

a public information network

rical and Electronics Engineers, Inc.
CON 75.

Loving Grace Cybernetics
1609 Virginia St.
Berkeley CA 94703

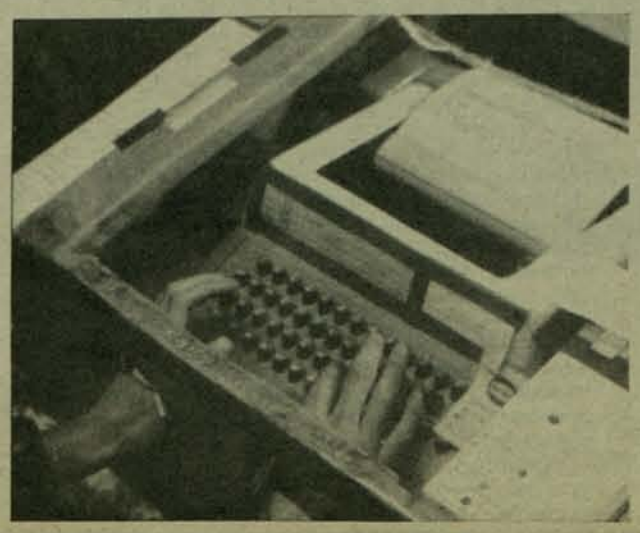
Other inherent problems appeared due to inexperience on the part of the users with typewriter keyboards, spelling errors, and misunderstanding of the keyword concept. The social interactions around the terminals have been the only way of dealing with these difficulties.

The other deficiencies encountered in the operation of the pilot system can be effectively dealt with through redesigned software. The primary consideration in current design plans, however, is maintenance of conviviality in the interactions with the users. People must gain a sense of understanding of and control over the system as a tool. While it must command sufficient intelligence to recognize and respond to the most naive user, that intelligence should be directed toward instructing him, demystifying and exposing its own nature, and ultimately giving him active control. Meeting this criterion without placing excessive demands on the user deeply tests the system designer's ingenuity.

This is especially relevant in the case of the current design strategy, which includes the implementation of a tree structure of categories as a parallel and alternative mode of searching for items. This would allow users unfamiliar with the system to browse through a structured environment of hierarchically categorized items while enabling more experienced users to search directly on content with the system in a more passive mode. Any such categorization scheme is necessarily biased by the paradigm with which the designer interprets and organizes the world. Minimizing this effect complicates the system and challenges the design group.

Other innovations under development include the implementation of named fields to aid narrowing the searches by date and value. Item ownership will allow 'information shepherds' and organizations such as switchboards and other referral agencies to maintain subsections of the data base for their own use while sharing it with the public. Dialoguing and conferencing will be more explicitly supported, while games and other special purpose programs will be available to various users.

The pilot system, supporting few terminals on a large, expensive general-purpose time-sharing computer, was not economically reasonable. Through careful mathematical analysis it has been determined that by using an optimized file structure, good searching procedures, and a thoughtfully coded mostly core resident program, more than 64 simultaneous users could be serviced by a 24K mini computer the speed of a NOVA or PDP 11/40. Such software is currently being developed along with custom terminal multiplexing hardware which will greatly reduce the load this many terminals place on the CPU. With the broad base for capital and maintenance costs this system provides and the use of the low-cost, people-oriented Tom Swift Terminal described elsewhere at this conference, costs should be less than $2000 per public access site.



Each of these minicomputer systems will be capable of networking with others, exchanging information of a non-localized nature, and providing a nationwide conferencing medium. Groups such as Infact in Vancouver, B.C. and the Boston Children's Museum are contributing to the design of the mini-system while testing concepts with their own systems based on Community Memory. A cooperative effort seems the correct way to bring about systems for information sharing.

The cooperative use of technology to meet human needs, rather than its competitive use to create lucrative mass markets in electronic elaborations of simple devices and services, is the basic goal of the Community Memory project. This sort of direction is a sadly rare style among engineers, programmers, analysts, and the people who coordinate their work. But the issues of how and for whom the technology will be made to perform are becoming ever more critical. They play a deep role in the continuing economic, ecological, political and energy crises. These issues must be dealt with by both the people who have mastered and currently control the technology and those people it is claimed the technology is serving. But the heaviest responsibility lies with us, who create with the technology, to be conscious of the significance of our creations and to actively make sure that they are directed toward the greatest good.

REFERENCES

1. Christopher Beaty: *The Journal of the Bay Tea Company (The Public Memory Papers)*, 1974, privately published and distributed.
2. Ivan Illich: *Deschooling Society*, Harper and Row, New York, 1971.
3. Ivan Illich: *Tools for Conviviality*, Harper and Row, New York, 1973.
4. *Mediation*, vol. 1, no. 1 , Loving Grace Cybernetics, Berkeley, CA.
5. Laurence I. Press: "Arguments for a Moratorium on the Construction of a Community Information Utility", *Communications of the ACM*, vol. 17, no. 12 (Dec 1974).
6. Robert M. Shapiro: *A Handbook on File Structuring*, RADC-TR-69-313, Applied Data Research, Inc., New York, Sept 1969.
7. Kenneth J. Stetten and John Volk: *Interactive Television*, M72-200, The Mitre Corporation, Washington, 1973.

This article and several others are included in the Journal of Community Communications, Vol. 1, Issue 0, published by LGC Engineering, 1807 Delaware St., Berkeley CA, 94703.

The purpose of the Journal is "to encourage and develop the dialogues which are starting concerning the desireability and possible forms of low - or non - hierarchical communications systems which can be created, shaped, and used by people in their daily lives as members of communities".

A free copy of Issue 0 is available from LGC if 20 cents postage is included.

WHAT IS A KIT?

A kit for an electronic device usually consists of one or more printed circuit boards, a bag of bits and several sheets of paper with instructions. Often a case for the device is included, or the materials needed to make one. Solder is sometimes included too.

Most can be put together with a soldering iron, a pair of wire cutters, a pair of pliers and a screw driver. Homes are presumed to have these, so they aren't included. Assembled, a small kit will usually perform (with at least a family resemblance to the item you thought you were getting when you read the advertisement) trouble free from the first time you apply power. Any necessary adjustments for tuning will normally be no more difficult than the assembly and require no special apparatus.

Advanced kits are more complex, but generally they take longer to put together rather than require more skill. Tuning can become a problem though, since advanced kits often require the use of electronic instruments. If you can't borrow them, your only recourse is your local TV repair shop. However, the cost isn't much considering that your kit probably cost several hundred dollars. The real catch with a large kit is that it is much less likely to work first time – and this isn't necessarly either your fault or that of the manufacturer. Those of us who are not used to electronics components expect items to be as they are described. We expect a 5/8" nut to fit a 5/8" washer. Semiconductors are different. The manufacturer produces a specification sheet which is replete with digrams showing nice clean square pulses ⎍⎍⎍. What you get is actually more like ∫∩∫. And you don't even get that if your component is one of the percentage that doesn't work at all. Don't heap blame on the maker – if he produces a high quality item, it merely means that almost all meet the specs. Testing is costly; the user pays for it, and it can't detect every faulty item anyway. Typically there is a high failure rate for the first few hours of use, dropping to a very low one and then eventually rising again as the product approches the end of its life span. This aging takes place in your machine because you can't afford to pay the manufacturer to age it for you

So what do you do? If it doesn't work you fix it. Whether you can depends on what it is - a loose wire, solder bridge or obvious component failure yes, but often you can't. Fixes require understanding what is wrong, and this the kit doesn't give you. Fixes usually require equipment which you probably don't have. A simple device you may well fix, but increasingly, kits are anything but simple devices. Integrated circuits enable a child to assemble a device which may be electrically more complex than a WWII radar installation.

Can you build a kit? Sure despite the size and complexity of even the largest kits, they all go together piece by piece; one easy step after another. Start with a little one though, the big ones require many hours of work, and it's easy to become discouraged, since nothing will work until it is all finished

There are lots of reasons advanced to justify the purchase of a kit. Some are valid. Some are rationalizations. Some are plain fallacious. Mostly kits are bought because some phrase in the advertising clicked with someone's dream. This process of selection defies logic, but knowledge of good and bad designs makes it more likely that an unconscious choice will be a good one.

Many kits are purchased because the buyer can't afford a professional unit. The impression is often fostered that the kit is cheaper because the manufacturer is saved the cost of assembly. But when it is assembled IT ISN'T ALWAYS A PROFFESSIONAL UNIT that THE BUYER GETS. One of the sad truths of the world – almost everything that is manufactured is cheaper and better than the nearest equivalent that the amateur can build. If you buy a board from DEC for your PDP8, you will find that it's expensive. If you build your own, you will save – but in a little while the contacts on your board will oxidise and corrode causing trouble. While the gold plated ones from DEC are still OK. Some of your components may give trouble. So may some of the ones DEC uses – but they got rid of any which were not quite up to specs, sold them to the guy who sold them to you.... And you don't have the equipment to test them with anyway.

If you have a problem, you can call a major manufacturer and get help. Part of the higher cost of their boards goes to pay the salary of the guy who answers the phone. If you paid a small kit manufacturer the same money, he could afford to do the same but you didn't, so don't expect the same level of support.

This is not always true, see our report on Processor Technology, but take note of this quote from the Micro 8 Newsletter:

> *" Let us repeat! When you send off a check to a supplier, kiss it goodby, because you may never see that money again. What's almost as bad is if the check gets cashed and you wait months for delivery on the items you need now. If a guy's advertising looks too good to be true, it probably is. If it looks like he is offering too many hard to get items, beware. If he can supply them, other people could also, and they wouldn't be hard to get. If the prices are much lower than other outfits, he's probably selling junk and its hard enough to get these complicated computer systems running without having to find defective parts as well. What do you do when a guy offers something you have to have and he is the only one that offers it? I don't know. But you'd better clarify everything by telephone and or letter before you send your money.*
>
> *If they accept Mastercharge of BankAmericards, you've got several things in your favor. At least some bank recognizes them and part of the agreement they sign is that they will submit information on when and how items were shipped. If you don't get them, you just stop payment on the bill at your bank. "*

There is one final criticism of kits: If a kit is not part of an instructional course, there is usually very little to be learned about electronics by building one. The instructions may read, "Orient the diode as shown in DIAG.4, solder." This doesn't tell you its purpose in the circuit, much about it as a component or even why the orientation matters.

HOW MANY BITS?

Bitter arguments rage on this topic. For the hobbyist the choice is pretty much 8, 12, or 16, and each has its disadvantages. The best choice will be a compromise and will depend on the use to which you put your computer: math, character oriented or machine control. The size of a number defines the use to which it can be put, and the smallest useful number is six bits or 64. This gives a code sufficient to express numbers, a few special characters, an upper case (all capitals) alphabet and twenty control characters. This is enough to drive a TTY but inadequate for other duty and inherently produces text which is unpleasant to read. It has one other thing going for it - groups of three digits suit expression in octal, which is much nicer to use than hexadecimal, which fit groups of four. For reasons which will be apparent later, it is best to combine two 6 bit bytes to produce a machine which uses 12 bit words e.g. the PDP8's.

Seven bits is awkward to use, being odd, so the next standard is 8 bits, or 256. This does provide a code for any pattern we might want to print, plus all the control codes we might read. If you want to control a machine, it will provide steps of ¼%, which is fairly smooth, but doesn't match the 10 bit output from most analog to digital conversion. Its real disadvantage lies in the fact that 256 is too small to be directly useful for math.

Experience shows that 6 decimal digits are enough precision for general purposes, which is why BASIC is standardized at that. But this represents 24 bits - so with an 8 bit machine the processor must lose time addressing memory, particularly since it must specify a memory address each time, normally two more 8 bit bytes. The processor, to get one 24 bit value, puts two bytes on the address bus, gets one back on the data bus, puts two out, gets another back, puts two more, gets the last one back. This is tedious - but it is nothing to the number of steps necessary to even just add two numbers, since the processor then has 6 bytes to work with, plus any carries that might be generated.

Obviously the 12 bit machine will only have to go to memory twice to get 24 bits, and it will be simpler to perform mathematical operations. For machine control, 12 bits is a fair match to the 10 bits from an A to D converter and gives the precision of better than 1 in 1000, which is fine. Each 12 bit word can also represent two 6 bit characters, so the machine is well suited to running in BASIC on a TTY. But it can't easily talk in lower case (small letters), and if you want to do business math, you can't easily express $10,000.00 because you have only 6 decimal digits in 24 bits. And when the processor tries to talk to memory it has real trouble. 12 bits is about 4000 decimal, so that is the limit of the size of memory which can be directly addressed - and indirect addressing is an unbelievable pain.

The 16 bit machine can directly talk to 64,000 memory locations, enough for most purposes, and does so in a simple operation since it has 16 bit words which suit 16 bit addresses. Two such words provide 32 bits of precision, or about 9 decimal digits (fine for business math). One 16 bit word holds two 8 bit bytes, so it can be use the desireable 8 bit character set. The processor has lots of instructions, and is, therefore, easy and flexible to program. So, this is the way to go – right? Well not necessarily, because at somethings a 16 bit machine is big enough to begin to be inefficient and it costs quite a lot more.

If you want to work with single characters, your 8 bit machine will run only slightly slower and use half as much memory. Your 16 bitter has to remember not only the location of the word, but also which byte, a programming complication, and it isn't as efficient in the use of the memory it stores instructions in. Both use 2 bytes to store an address, but the 8 bit machine uses only one for an instruction while the bigger machine has to blow a whole word. On the other hand, the 8 bitter may need three or four instructions to do something which the larger machine does with one. Similarly, with math operations. If you need 32 bit precision, the 16 bit machine is tops. But if you don't, and you don't to run BASIC - the bigger machine may be of little advantage. It does better math than the 12 bit machine, because of the greater precision, but it is not necessarily faster. For some operations, the speed is the same - it takes a fat man no longer to go through a fat door than it takes a thin man to go through a thin door - but for other operations it depends on the number of bits involved, 32 verus 24. And the cost and complication increase sharply.

I/O devices are arranged to handle single characters, usually 8 bit. This involves expense and complications since the 16 bit processor talks in two character words and something has to translate. The processor itself is more costly, and within the machine there are typically twice as many components to route the wider signal.

So it comes down to the following choices:

With an 8 bit machine, you can run BASIC, machines and handle text quite well and cheaply. But for business use, you must extend your precision and for involved math, you must also have patience - it will take time.

With a 12 bit machine, you can efficiently run BASIC and machines, have real problems addressing memory, a lousy character set, a slight increase in speed over 8 bit, and all that PDP8 software.

With a 16 bit machine, you can do serious math work at reasonable speed, but for simple math or character manipulation there may be little advantage to balance against a sharp increase in cost and complexity.

In the 8 bit hobby field, , these are, at present, three LSI chip contenders, the Intel 8008, the Intel 8080 and the Motorola 6800. The 8008 is the oldest and there is quite a bit of software for it. The instruction set is small; a disadvantage, but its real problem is lack of speed. With the cost of the faster 8080 dropping, rapidly, there seem little reason to buy the 8008 in preference. But it remains a competent processor, and there will soon be a lot of memory chips that are very cheap becausethey are too slow for the faster CPU's, so if the price is right....

That leaves the 8080 and the 6800. There is little too chose in speed between them. The 8080 lends itself to much better memory bus and I/O arrangements. It has one accumulator plus a selection of registers while the 6800 has two accumulators, a clear plus for many arithemetic operations. The 6800 also has elegant interrupt handling features built into the chip - to match them the 8080 needs a seperate board. The Motorola product range includes a number of particularly attractive chips, but the Intel range is much more extensive and software for the 8080 has a long development lead.

8080 NEWS: MITS is still swamped with orders, having problems with suppliers, run ragged with phone calls and has shipped some copies of 8K BASIC. They are being second sourced widely - see our report on Processor Technology.

8008 NEWS: Prices are falling.....falling.....

6800 NEWS: The race is on for the first kit based on this chip - odds on favorite is SPHERE - see report. We know of others and will publish a list and progress report next issue.

12 BIT NEWS: Contenders here are the PDP8A or the new chip from INTERSIL. Currently no kits, and either needs an OEM buy. Write to C. Richard Corner, 514 So. 9th St., Moorhead, Mn 56560 of the Micro 8 group who is trying to put one together. (Also for LSI-11)

16 BIT NEWS: LSI-11 boards from DEC - but OEM only, see note above. Two new kits from Bill Godbout, see report, one a near NOVA, the other an MSI-11. Nothing else in sight but these look so good we are dropping our interest in an OEM buy on the LSI-11.

TV Typewriters

TV typewriters are not very complicated and should be very easy to make from kits or plans, but they seem perculiarly susceptible to trouble. We have yet to hear of anyone one making one and having it work first time. Mostly this has been owing to broken solder traces, solder bridges, or faulty components - one or two in most kits.

Surprisingly, this doesn't seem to bother people. No one was sharply critical of Southwest Technical, and an overwhelming majority of owners of their kits were satisified that they had received value for their money. This may reflect the comparative sophistication of Bay Area electronics hobbyists. Few here are surprised when components don't work — even reputed "tested" ones straight off the shelf. And enough is heard of things that go on in the electronics industry to develop both a background against which the honesty and technical competence of a company can be judged, and a sympathetic understanding of the problems of the manufacturer.

The location of faulty IC's generally proved fairly straightforward. Though the friend with a scope came in handy, most owners felt their trouble shooting could have been done with a good multimeter. Failures are sometimes mysterious. One father/son combination, building a SWTP CT1024 powered it up and found it had a couple of faults. Rather than struggle, they promptly bought a Heathkit scope kit, built it and found that unserviceable too. After three faults had been fixed on that, they got back to the TVT and located a faulty IC, which they replaced with a new, high quality one which they had tested to make absolutely sure that it was within specs. Didn't work in the circut so they replaced it with a nasty cheap surplus one, sans pedigree, which worked fine. One solder bridge later their TVT was up, running and, according to their shiny new scope, propagating the right pulses to the right places. Owners delighted and happy with both kits.

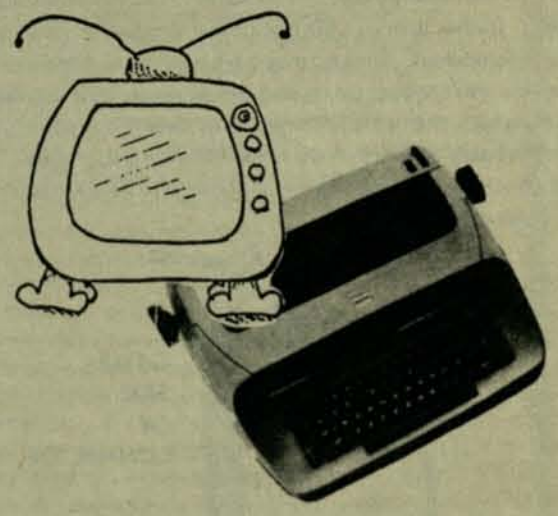
The only kit manufacturer with much track record for TVT's is SWTP. The newer kits are better in all respects than their first ones, and owners seem satisfied with them. They have very low density boards, so are easy to work on, but the assembly instructions are primitive, particularly on the subject of actually connecting the thing to a TV. Two design weaknesses stand out - oxidizable copper contacts on the keyboard and the use of Molex connectors. These latter are pins soldered to the PC board on which other boards are mounted. Thus the smaller boards are at right angles to the main board and cantilevered - an inherently weak arrangement and very vulnerable to accident. The stresses produced at the base of the pins tend to bend the board and break the traces. This mounting technique is cheap and neat - but a no no where vibration or shock are factors - or where boards are often removed and remounted. So if you anticipate trouble, plan on mounting the boards seperately and either wiring them permanently together or using plug and cable.

The greatest advantage of the SWTP kit lies in it being a complete system, with all that is needed for it to be useful. There are cheaper kits available, but they have less in them, and anything less can prove irritating. Those working on time share have found that a limited screen memory allows a mere glimpse of ones data - now you see it, now you don't — before it vanishes forever as the dumb thing at the other end of the phone line relentlessly regurgitates the contents of its output buffer - typically 300 characters.

The SWTP kit has an adequate memory, options for sophisticated cursor control and the ability for the memory to be used as an extension of your computer's.

But if you can't afford the goodies in the more expensive kits, or have a sufficently limited application that a simpler device ia adiquate, a TVT from THE DIGITAL GROUP, P.O.Box 6528, Denver, Co. 80206 may be just what you are looking for at about $100.

Regarding building TVT's from articles in hobby magazines - if you are an experienced builder, you can evaluate them for yourself. If not - don't



Report SPHERE

96 EAST 500 SOUTH - BOUNTIFUL, UTAH - 84010 (801) 295-1368

The first kit based on the Motorola 6800 chip has been eagerly awaited - and it looks like it will be the Sphere. We haven't seen one yet, but have talked with Michael Wise by phone. The differences between the Sphere and the Altair add up to a divergence of policies sufficient to add a new dimension to the expected 8080/6800 market battle.

The initial deal sounds incredible for the price: CPU, 1K PROM,4K dynamic RAM, 16 line x32 character module for home TV display, 73 key keyboard and the necessary power supply - all for $650.

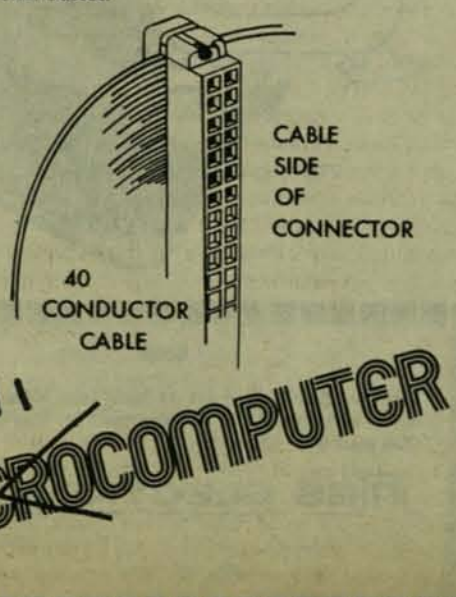
At first sight this looks a much better deal than the Altair, but the unit has no front panel, much of the cost of the latter. Sphere buyers will be up and running with a high level language for quite a bit less money than Altair owners, but they will have more difficulty if they want to work in assembly language. They will also miss one of the real advantages of the MITS system, the Altair front panel is really well arranged as an educational tool for teaching binary operations. Sphere BASIC is being developed to be very similar to HP BASIC in its instructions while MITS is close to DEC BASIC. This will become a significant factor in any choice.

Any new venture has problems with capitalization. Sphere has a super deal as an introductory offer, but are asking cash in advance. You save quite a bit of money because you trust them to deliver. Their price seems about right for what they are offering, a healthy sign, and what limited contact we have had with them left us with a good impression. For instance, they don't mind admitting that they are being carefull with both their funds and their promises. Pity more companies aren't the same way!

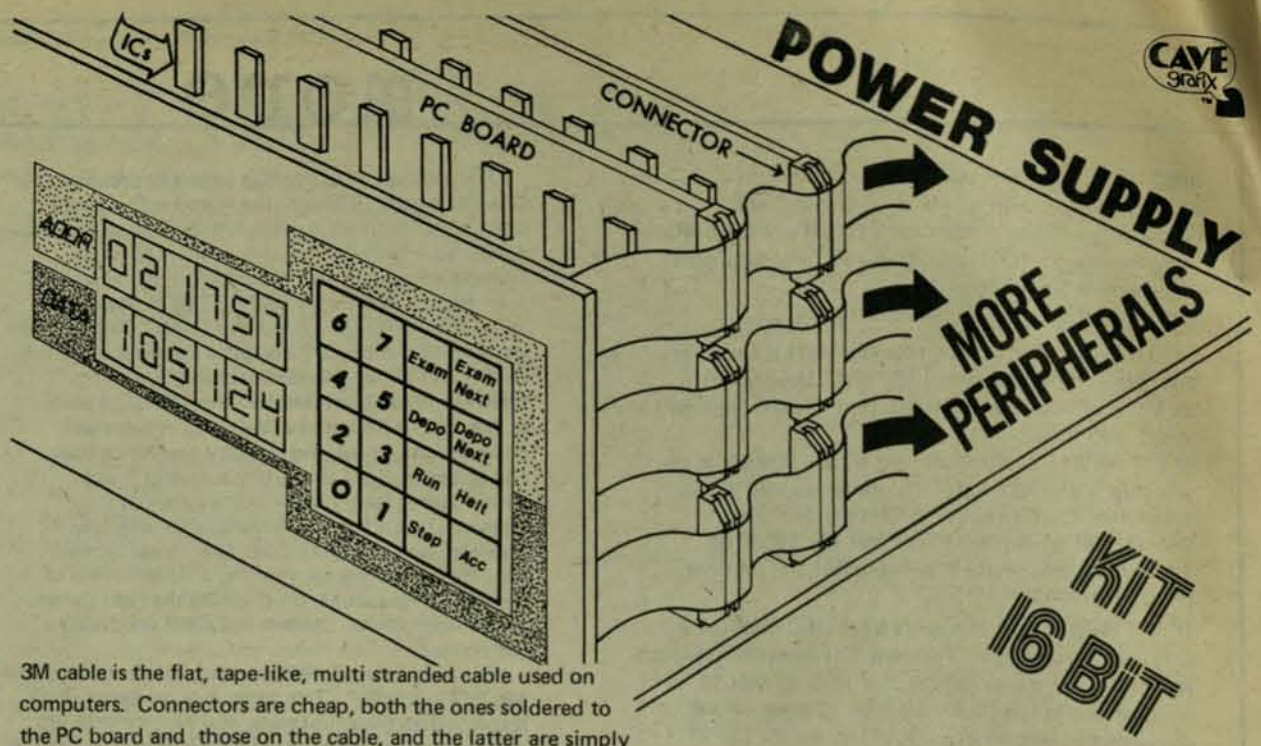
Report

Bill Godbout has been a mail order parts supplier for years, with an enviable reputation for producing good deals. (A 4K x8 bit memory board for $163 for instance.) His latest is the first 16 bit computer kit - a true minicomputer, not a blown up micro. And not content with this, he is about to produce the second!

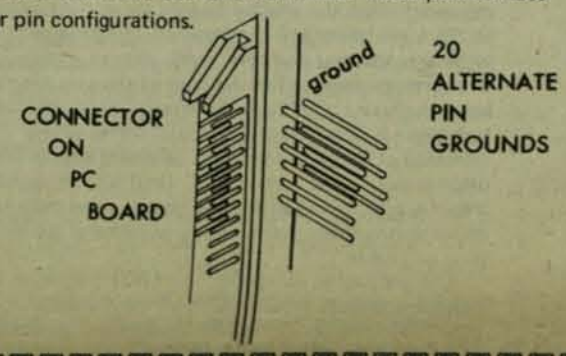
The first is based on an LSI chip which behaves like a NOVA CPU - four accumulators and a similar instruction set. To get the cost down, some corners have been cut and every unnecessary frill ruthlessly purged. Surprisingly, this has improved the beast. Rather than an LED front panel display, it has an octal numeric readout. The idea may have been to save money, but the result is both clarity and convenience. Another cost-cutting idea, the bus is 3M cable. This saves the expense of a motherboard and its sockets, while allowing a flexibility which will generate much envy in those who have to suffer with conventional busses.



MINI ~~MICRO~~COMPUTER



3M cable is the flat, tape-like, multi stranded cable used on computers. Connectors are cheap, both the ones soldered to the PC board and those on the cable, and the latter are simply pressed into the wires. So if you want to build your machine into your desk, you can have a board in each drawer and a flexible bus between them! This may not sound much advantage, but it means you can take the whole bus out to a peripheral, or use boards of otherwise incompatible sizes or pin configurations.

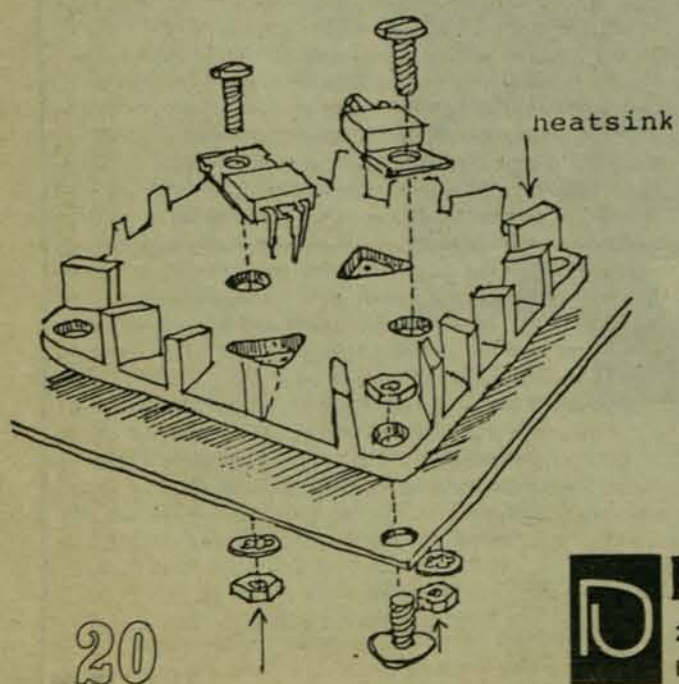


Godbout's second kit - for release mid October, is an MSI (Medium Scale Integration) copy of the PDP 11. It has a fast clock, 300nS, but is a micro coded device, so the effective speed is a lot slower, presumably, than the clock. The big questions are whether it uses the same instruction set as the PDP 11/40, and whether DEC allows the use of the Unibus concept. We will keep you informed!

GODBOUT
BILL GODBOUT ELECTRONICS
BOX 2355, OAKLAND AIRPORT, CA 94614

Report

IT is common knowledge that MITS is having severe difficulties filling the thousands of orders thay have received. Don't blame them too much for the delays. They expected to sell 500 Altairs the first year, hoped for 1000, now find themselves having to build more than that each month. They were thrown in at the deep end when the first article appeared in *Popular Electronics* (we hear that it was printed two months before they were ready for it??) and they have not yet acheived control of the situation. The inevitable production delays, to quote from a comment heard at the Homebrew Computer Club, have spawned a whole new cottage industry. Boards designed to plug into the Altair bus are being made by the thousand. Will this hurt MITS? Not much, and it may even help them.



The largest question mark hanging over the Altair was "Is this a toy, produced in small quantity and then forgotten because it isn't supported?" The answer now is an emphatic no – principally because of the extent and quality of this second sourcing. The Altair made it big because it was a good design at the right price for the market concerned. It is now so widely supported that its bus is a de facto standard. If you have an Altair, you can be confident of support for years which makes buying the mainframe increasingly attractive.

Processor Technology is one of the companies producing plug compatible boards for the Altair. We saw some of their first assembled units and were impressed. Since then we have learnt a lot about them and put together two of their kits: a 4K static RAM board and a 2K PROM board. We've also seen the first production batch of I/O boards. They have three parallel ports and one serial, with program selectable Baud rates.

We had only the preliminary instructions but had no real problem assembling the kits. The boards are just beautiful! We have seen little professional equipment that is better. Gold plated contacts; milspec, high speed, low power consumption memory chips; all quality components and, lest people use it in desert heat, a heat sink of generous proportions and comforting ugliness. The kits were not just complete. They arrived with a coil of quality solder, soldering instructions, even wire for jumpers. And in neat ziploc packets at that.

Bob Marsh, who runs the company, explained how come the general quality level. Seems they designed the board, and by the time they got to production, all the components had dropped in price by 15%. So, rather than drop the announced price, they put the extra money into higher quality components, figuring that if they put out a super product they wouldn't have to deal with many complaints...

Processor Technology Co.
2465 Fourth Street
Berkeley, Ca. 94710
(415) 549-0857

The PAIA Gnome Micro-Synthesizer

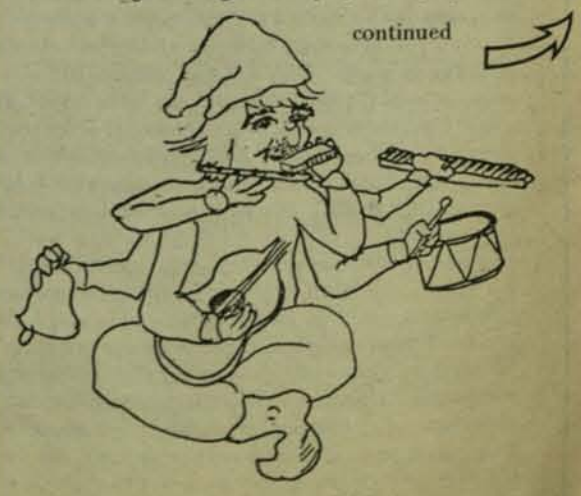
a review

by Howard A. Hurtt

I was assigned the task of evaluating the performance of the PAIA Gnome after successfully driving LeRoy Finkel out of PCC/Dymax with it. "Get that idiot and that damn box out of here," was how my assignment started. My interest in electronic music dates back to my early childhood, when I could entertain myself for hours with the sound of a Waring blender.

The Gnome is not a musical instrument, but it can help provide some insight into what musical sounds are made of and how they are synthesized. What puts the Gnome a class below a Moog is its inability to produce tones with repeatability. The tonal range of the micro-syntheiszer is continuous within a floating setting, and finding fixed notes with the slider is all but impossible. A mere tweak of the range knob is enough to send the whole scale bounding two or three octaves left or right. Songs can be played only by

continued



STARTING UP YOUR OWN CENTER

Once you have decided that your group can no longer muddle along in happy anarchy, you have to decide on the type of organization you wish to form, then find out how to go about it. If you buy the advice of a lawyer the probable set up cost will be about $1000. Can you do it yourself? Yes, read on...

Gnome plays on

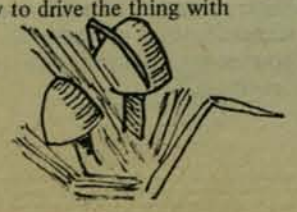
" sneaking up" on notes which gives a Gnome concerto a distinctively sleazy quality. In a recent duet with my father, a professional harmonica player, I found myself sliding bumptiously up and down, chasing the 64-hole chromatic Hohner with the fervor of a rabid Chihuahua. The harmonica player soon began to weep and grunt and miss notes, which enabled me to catch up with him. We kept ourselves in stiches until a humorless spectator turned off my amplifier. One disadvantage of unconventional instruments is that some people automatically define different as bad.

The PAIA instrument has pretty fair versatility for something its size and price range (about $50 in kit form). I was able to more or less simulate a piano, a bell, a drum, a guitar, a flute and even a harmonica with it, to Dad's dismay. The Gnome's forte, of course, is sounding like a Gnome. Once one gets acquainted with the principles of fundamental wave shape, skew. timbre and envelope, almost any sound imaginable can be rpoduced. Matter of fact, give me a Gnome, an echo chamber, a multi-track recorder and some time, and I'll give Walter Carlos a run for his money. A good stout hi-fi amplifier is a must for proper operation of the Gnome.

There are a few problems with the PAIA Gnome which tend to make its operation something less than ideal. Most notably, the trigger pushbutton switch has lousy action. It is much too stiff and bouncy for comfortable, accurate noting. I would recommend replacement with a switch with cleaner action. Next is the problem of control interaction. Many of the controls, particularly those in the voltage controlled-filter section, tend to influence the output of the unit when they are not supposed to. To take the VCF completely out of action, it is necessary to turn it off at two locations and rotate four potentiometers fully counterclockwise. The VCF repeat function is very mysterious. It seems to work as expected only when it is inclined to do so. Finally, the controller range, which influences the tonal width of the slider, only works reasonably in the upper third of its rotation. The master oscillator range has the same problem. This seems to be a design error.

Despite these limitations, and its overall unpredictable qualities, the Gnome is an educational and very entertaining kit. It can do half as much as units costing ten times as much. It is easy to put together, having the most lucid assembly instructions I have ever seen on a kit. The completed synthesizer is functionally tidy and solid, which it needs to be, considering the force necessary to push the trigger button. The literature includes a very clear and informative tutorial on synthesizer theory and operation. In about an hour, if you bother to scan the instructions, you can be tailor-making your own noises. And if you are good at feeling your way around and faking notes, you can be butchering songs shortly afterward.

The PAIA Gnome would be ideally suited to a progressive secondary school music program or a college course in synthetic music. It is also well within the range of the average electronic music freak for zooop-ing along with Stevie Wonder at home. Now, if we could figure out a way to drive the thing with an Altair...



There are two basic types of organizations; partnerships and incorporations, and they may be profit making or non-profit. A partnership is a group of individuals joined together for a common purpose and recorded in the State records as such. Each partner may transact business for the partnership, and EACH PARTNER MAY BE INDIVIDUALLY HELD LIABLE FOR THE CONSEQUENCES OF THE TRANSACTION. So if you are a partner, someone else may incur a debt - without your knowledge or consent - and you may find your personal assets being seized to repay the debt. Partnerships have other problems. In some situations a majority is not enough. One no vote may act as a veto, so one partner may be able to paralyse the business activity. and the partner concerned cannot easily be removed. Before passing on to incorporations the author has to confess some bias. He was once in a partnership.

Corporations are an English invention to deal with the problems of partnerships, and their principle purpose is to limit the liability of those involved. In the eyes of the law, a corporation is a person (lawyers are sharp and have no difficulty distinguishing between a natural person and a corporation). This person is, not being human, comparatively incompetent and so its affairs are controlled by a board of disinterested persons called directors. Since these worthy people are merely giving the person advice, any debt incurred is incurred by the corporation - not the directors. And this is so unless the directors act criminally or recklessly. Now you may be thinking, "Whoa there, back up. What was that about the directors being disinterested?" Well, that was really the cute part about this strange English invention. The directors are disinterested because they don't own the corporation. They are merely good hearted fellows willing to be appointed to run it by the true owners. These are people who bought shares in the corporation. They own it, but take no part in running it - except that annually they elect the board of directors. So the directors aren't liable for debts because they don't own it, and the owners aren't liable for debts because they don't run it. (And the true genius of the inventors becomes apparent when you realize that there is no reason why the shareholders can't elect themselves directors.)

In short, if you form a corporation, all you lose if it goes bankrupt is the value of your stock. This is nice but there are other advantages. Decisions are made by a simple majority vote, so business goes on regardless of arguments death or incapacity of individuals. There are also clear rules governing the conduct of the board which protect the interests of minority stockholders. But the reason for the clarity of such rules is that there is a bad side to corporations. Corporations aren't vulnerable to disruption by individuals with honest differences - but are susceptible to manipulation by the sharp operator, even in the absence of outright fraud. Courts have rightly taken a jaundiced view of the behavior of such organizations and endeavored to lay down rules to prevent manipulation - but with limited success. Nevertheless, by far the most common form of business organization is the corporation which is testimony to overall advantages.

So far we have only talked in terms of normal businesses - organizations formed to make a profit for the people who own them. There are also non-profit organizations. The name is unfortunate and misleading, because they are fundamentally different from normal businesses and the difference has nothing to do with profit or loss - IT IS A MATTER OF WHO OWNS THEM.

Who does own them? Well as a matter of fact, you do.

All you people are members of the public and the fundamental distinguishing feature of a tax exempt organization is public ownership. Thus the true nature of a non-profit, tax exempt organization is that of a charitable trust (from which they are derived). That is to say an organization which controls and uses public funds for public good.

Now the fact that the public owns it does not give the public the right to directly control it - so tax exempt organizations are known as being quasi-public in nature, and they fill a curious niche exasperating to both the Judiciary and the Taxman. The judiciary finds great difficulty in penalizing the owners - the public - and the taxman has the same problem when he wants money. So what both do is try to limit tax exempt status to organizations which are genuinely public in nature, keep a close eye on them, and punish severely any failure to observe strict rules of conduct which they have laid down.

What sort of organization should your group form? Well - for starters, take my advice and plan on incorporating. Whether to go non-profit is more questionable. If you own your corporation, it's yours. If it makes a bundle, you must pay tax on it, but what's left you may put in your own pocket. If it goes broke, you lose the value of the stock you bought, but once the creditors have been paid, you keep what ever is left. Unless you sell your shares or it goes broke, you can't claim tax credit on money you put into it, because your only claim would be for a business loss.

A tax exempt type of organization is quite different. If you put anything into it, it is gone forever - since you have given it to the public, and the public is not about to give it back. *(If your organization collapses, any remaining assets must be given to some other non-profit organization.) However, since you are giving* something to the public, you can immediately deduct the amount from your taxable income. Even the IRS doesn't feel it reasonable to tax you a percentage of what you gave totally to the public. If your organization makes a bundle, the taxman won't ask for a penny - but you can't put it in your pocket because it belongs to the public, not to you. The ONLY thing you can do with the money is to spend it for the purposes for which your organization was formed. And to make sure that you do, both the judiciary and the taxman will require much higher standards of conduct from you than they would expect if you were profit making. Rightly so, because its not your money to be careless with.

So what's the point in being non-profit? The point is this. If you have a project which you feel is worthwhile, which will benefit the public, you can do your thing, tax free. And if you make a bundle, you get to direct the spending of it. And if there are public funds available, they can be given to you to spend - which can't be done if you are in business for yourself.

Now in either kind of organization, you can be paid for what you do - and paid enough to properly recompense you. So don't think that a non-profit organization need pay any different wages than its profit making counterpart. The taxman will be alert for any sign that a tax exempt organization is being run for personal gain, but certainly doesn't expect people to starve. The people who run non-profit organizations are public servants, just like the bureaucrats in Washington, and the taxman (unfortunately) doesn't mind the salaries they get.

How much will incorporation cost? About $25 if you do it yourself. How do you set about it? What do you need to qualify for tax exempt status? Read the next issue. And if you want a model non-profit accounting scheme, read the one after that. And if you want all this garbage, with sample (PCC's) By-Laws and Articles, send us $2 for a xeroxed booklet.

by Keith Britton

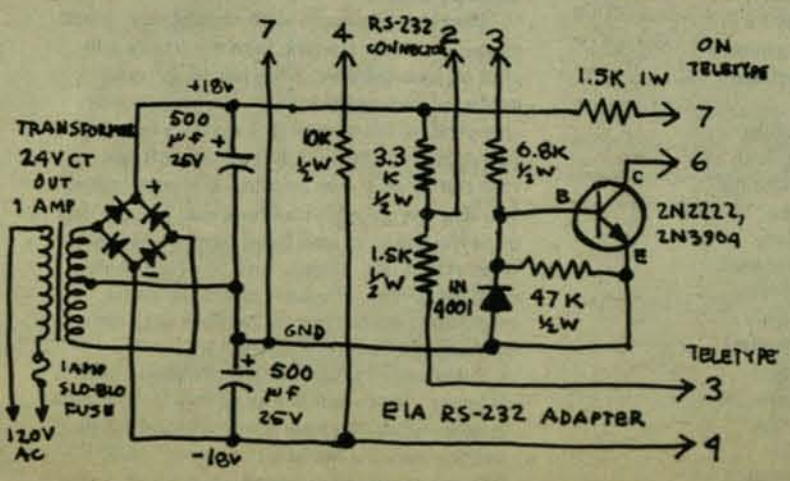
CURRENT CONCERNS

by LEE FELSENSTEIN

The Teletype Model 33 will be around for a long time. In spite of its noise, slowness, maintenance problems and slow delivery, there is nothing equivalent at twice the price.

The Teletype Corporation has some very good manuals available which explain the operation and adjustment of the mechanical innards, but the crucial task of connecting the thing up to the outside world is not covered by Teletype or anyone else. In fact, those of us who do that sort of thing agree that the knowledge of how to hook up a Teletype is folklore, passed on by oral tradition!

So, for those of you who are staring at your new (or used) Teletype and are wondering where the data plug is, this article will reveal to you the secrets of the MYSTERIOUS AND OBSCURE CURRENT LOOP!!



SOME HISTORY

The teleprinter (now known as a Teletype) was invented around 1917 as a high-speed printing telegraph sender and receiver. It was designed to connect with a lot of other teleprinters through a single loop of wire.

On a railroad telegraph system, for instance, the Teletype in each station would have a wire coming in from up the line and one going out down the line. At the end there would be a 48 volt battery and the current would be returned through the rails to the other end of the line. So there was a loop which current would flow through when nothing interrupted it.

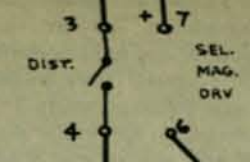
Inside each Teletype there were two sections; the sending part and the receiving part. The sending section was basically a switch which was normally closed. The receiving part was an electromagnet which would start the printing mechanism when it let go.

The two sections were connected in series. When nobody on the line was sending, current would flow in, through the sending switch (or distributor), through the electromagnet (or selector magnet) and out to the next machine.

When someone started typing, the distributor in their machine would open and close in a carefully-timed sequence as they hit each key. When the switch first opened, the selector magnet in all of the Teletypes on the line would let go and the printers would start clattering. The data was transmitted into the mechanism of the Teletypes by the motions of the selector magnets as the printers went through their cycles.

In telegraph talk, a line with current flowing in it was said to be in a "marking" condition. A line with no current was said to be "spacing". These terms are still in use, but digital electronics has added numbers to the game. A "mark" is equivalent to a '1', and a "space" is equivalent to a '0'.

The railroad-type current loop hookup (called 'simplex connection') is no longer in use, but Teletypes are still built as if it were being hooked up that way.



WHAT'S INSIDE

When you get the cover off your Teletype you will see the Electrical Service Unit on the right-hand side. Lots and lots of wires.

All of these wires end up at a panel of square white plastic connectors on the back. Don't worry about them. Look underneath them on the rear panel and you will see a black plastic "barrier strip" with screw terminals for connections.

You may have to remove a grey fiber insulating strip to see it. Before monkeying around in there UNPLUG THE POWER CORD! The two left-hand terminals on the strip connect directly to the power line. You could get a very big surprise if you touched them while they're "live".

The fiber insulating strip has numbers embossed on it. these are the numbers of the terminals. They start at the left and go from 1 to 9.

Terminals 3 and 4 are the distributor contacts. The contact is made by a carbon brush and the resistance is current-sensitive. An ohm-meter will show a few hundred ohms resistance, but with 10 milliamperes of current going through the distributor the resistance is less.

Terminals 6 and 7 are the selector magnet driver inputs. The driver is a transistorized circuit on a green card in the Electrical Service Unit. The input to this circuit is sensitive to polarity - pin 7 must be positive with respect to pin 6. Only when current is flowing in that direction will the Teletype sense a "marking" condition.

You can tell when this happens because the Teletype will stop chattering when its switch is in "line" position.

GOING OUTSIDE

When hooking up the Teletype as a current loop device, there are no standards as to which pin of the modem or computer interface connector goes where.

Here some knowledge and documentation about the modem or interface is necessary. A few general notes are possible, however;

* The distributor contacts (3 and 4) usually connect in series with a terminal in the input section and a terminal connected through a resistor to a voltage source. This resistor should be able to provide 10 milliamperes to the contacts.

*As mentioned above, current flowing in either circuit represents a binary "1". Current should be flowing when no data is being sent.

*In a modem, the higher-pitched of the two tones represents a "mark" or a "1".

*The selector magnet driver circuit drops only a few tenths of a volt with its rated 20 milliamperes flowing through it. It should not be connected directly between a voltage source and ground without a current - limiting resistor in series.

RS - 232, ANYONE?

There are standard interconnections if another type of hookup is used. The Electronic Industries Association (EIA) has set up standard RS-232 for data connections.

RS-232 uses positive and negative voltage levels to represent "mark" and "space". A device using this setup cannot be hooked directly to the Teletype, but needs a converter. A schematic diagram of such a converter is shown. It's simple to build, but watch out for the AC power line.

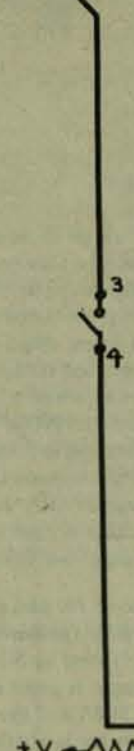
The importance of RS-232 is that a Teletype which is adapted for it can plug into any other piece of equipment which is set up for it.

In RS-232, a negative voltage level of more than 3 volts represents a 'mark' or a '1', and a positive voltage level of more than 3 volts represents a 'space' or '0'. The load presented to it must be greater than 3000 ohms and the transmitting side must be short-circuit protected.

A standard "dataphone" or "DB-25P" connector is used. The plug used has pins and the connector on the modem or interface has sockets.

Pin 2 is the data from the Teletype to the modem or interface
Pin 3 is data from the modem or interface to the Teletype
Pin 7 is ground
Pin 4 is the request-to-send signal, which may be necessary to enable the modem. "Mark" turns this signal "on".

Take care in soldering the connector, as the nylon insulation tends to melt with too much heat.



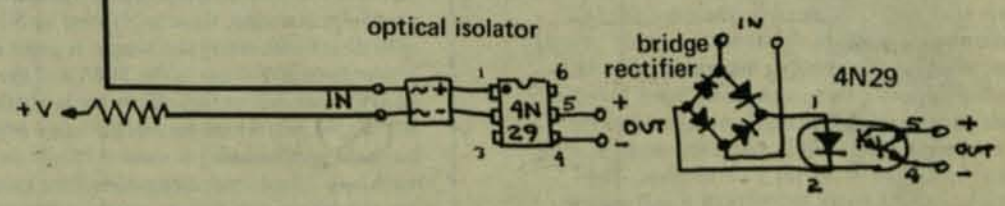
MORE, MORE, MORE, AND NOW!

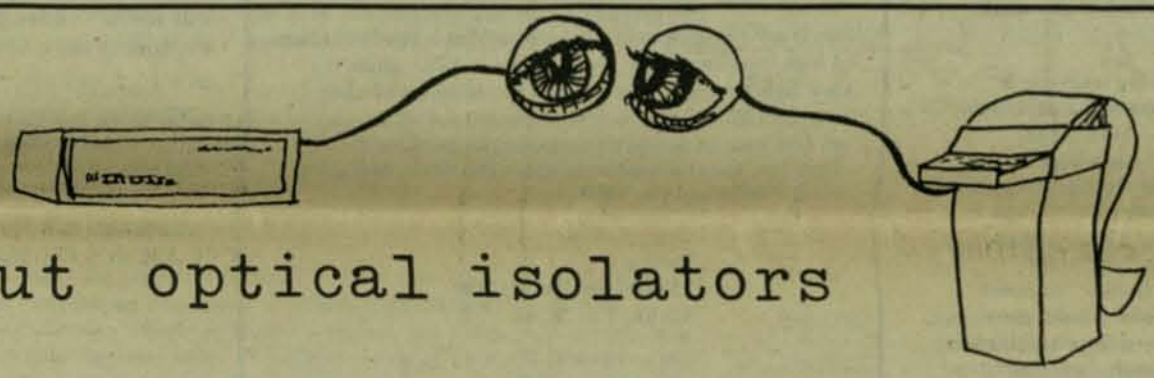
Many hobbyists seem to want to connect a Teletype, a modem, and a microcomputer interface at the same time, so as to put their micro "on line" as a kind of intelligent terminal.

This is difficult, because the modem and interface designers have made the assumption that theirs will be the only device hooked up to the Teletype. They designed their circuits so that one side of the distributor and one side of the selector magnet driver are connected to fixed voltages in their equipment. You can't take two such pieces of equipment and hook everything in series.

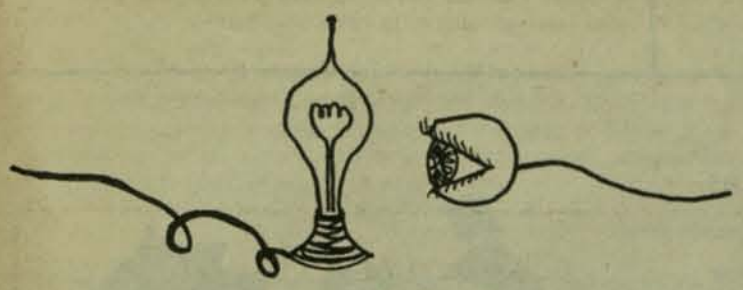
A little circuit you can build will provide the necessary isolation between current-loop devices. It consists of a 4N29 optical isolator and four diodes or a diode bridge rectifier. It drops about 3 volts across its input terminals, so you will have to have more than 6 volts available to run two of them. Nothing comes free.

The isolator is not sensitive to polarity on its input , though.

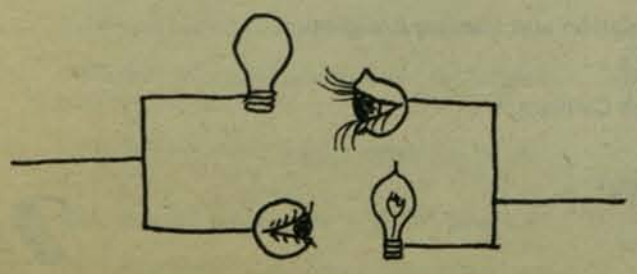


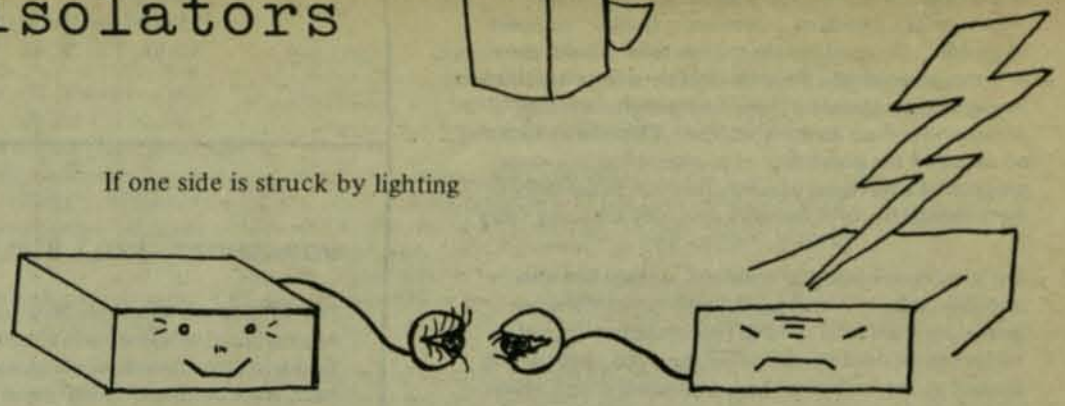


more about optical isolators



An optical isolator is a device made up of an LED (light emitting diode) pointed at a photo transistor. The current passing through the LED controls the light it emits, which is the light received by the photo transistor, which controls the amount of current the photo transistor allows to pass. So the current in the first curcuit controls the current in the second circuit, but the two circuits aren't connected! Now if you have two of those - pointed in opposite directions - it looks like a simple continuous piece of wire to both sides... but...

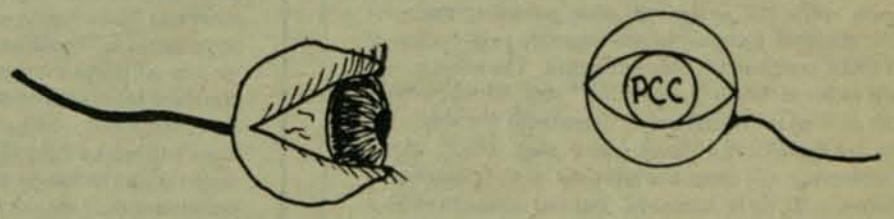




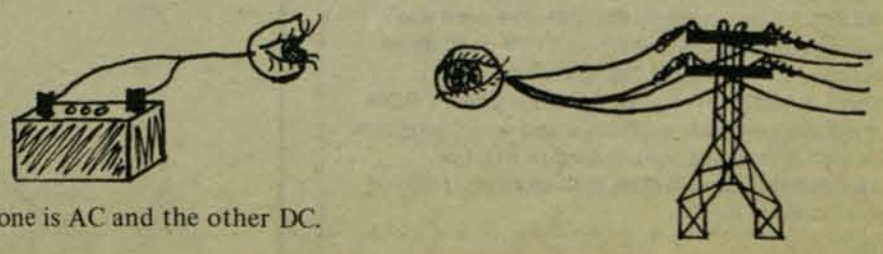
If one side is struck by lighting

the other side doesn't mind a bit and if...

one side has different voltages and/or current



both think the other is wonderful... even if...



one is AC and the other DC.

LETTERS

MACHINE OR ASSEMBLY?

This letter continues the discussion started in PCC Newsletter Vol. 3 No. 4, on the desirability of assembly language. The fact that some discussion exists is most encouraging, as it indicates that the question was properly raised in print. Naturally, each of us has personal concepts that he champions, concepts formulated from the perhaps incomplete data which we have had available. Public advocacy of a particular system is in our good interests, that we may gain from the discussion a new point of view. But to work for us, this advocacy should be regarded intellectually, that we may discuss rationally, avoiding emotionalism.

I advocate the use of octal machine-language programming on small 8-bit computers. My previously published arguments were generally based on the need for far greater memory to store an alphabetic assembly program than is required for the resulting machine code. As Mr. French points out, these arguments break down if the system translates each assembly command *as it is entered*, stores the command in machine-language, then translates it into alphabetics for TTY display. The system discussed is the MIL MONITOR 8 software for the 8008; this is a good starting point for discussion of the program entry and editing required in any small computer system.

Fundamental to the concept of assembly language is the knowledge that each alphabetic command represents a single machine-language instruction. Most large-computer assemblers are "symbolic," allowing an instruction-location to be tagged with a particular name. (There is some confusion in the industry about describing assemblers. In his *Minicomputers for Engineers and Scientists*, Korn differentiates an "assembler" which simply translates mnemonics, from a "symbolic assembler" that permits the user to refer to addresses in terms of symbols. I use his definition for convenience.) In a symbolic assembler, jumps are programmed by name, rather than memory address. This allows easier editing, and the possibility of re-assembling the same program at a different absolute location in memory if the program is stored in bulky assembly language form.

But if the assembler *just* translates alphabetics into machine code, is it that much help? Since the programming itself is an off-line process; short, logical, tables can be used to easily find the octal codes which are not yet memorized. And, occasional direct access to the octal instruction may be useful; 8008 redundant codes can provide useful software flags. But, assuming that you would still rather program in letters, how much more will it cost?

First of all, the MIL ROM's are no longer available, but this discussion is on efficiency, not availability. Some aspects of the MIL system are quite good (i.e., the TRN: translate program to new memory page command, and PRG: program PROM command). The editing (such as for setting a "break-point" step, which, when (such as it is) is in octal only. Commands are also included for setting a "break-point" step, which, when encountered, will cause the print-out of the contents of registers A, B, C, H, L, and M. But the contents of D and E are destroyed, and only one breakpoint at a time is allowed. Thus, the MIL breakpoint system is not the highly-desirable machine-language trace.

The MIL system utilizes over 1.5k of ROM, and *all* of the RESTART instructions. But a simpler octal programming, editing (such as it is), and TTY octal dump system can be contained in 256 bytes, anywhere in memory. A whole lot of memory is thus saved, a ROM this small can be readily duplicated, and useful programs which are not included can be added to ROM or perhaps stored until needed on the *Computer Hobbyist* standard cassette format.

I keep writing "such as it is" about these editors since I feel that the computer should be able to create space for forgotten machine-language steps by "bubbling-up" subsequent steps *and correcting the jump addresses;* it should similarly be able to delete steps. This is somewhat complex, not all that bad, but if this is already running on an 8008, I am not aware of it. Presently, the prudent programmer will insert NO-OP's to save some room for future modification and expansion. Similarly, an ideal system would include CRT editing and full CRT trace of each register after every machine-language step, or as desired. This system is feasible on the 8008, although extra hardware is needed.

I should note that the arguments for and against an assembler should be tempered by application to a particular machine; these apply best to 8-bit machines with direct addressing and simple register-transfer instructions like those in the 8008 and the 8080. Somewhat greater instruction efficiency is obtained in instruction sets which are less humanly logical; machine-language programming is more difficult on these machines. And some larger-computer instruction sets (16 bits and up) are so complex that they virtually require the use of some sort of symbolic assembler.

Nor is my position to be misconstrued as a condemnation of high-level languages; my true love is APL, which is a very high-level language indeed. But in terms of what you pay (data storage and/or memory) for what you get (the ease with which you make the machine do what you want) assembler is about the worst deal going for the 8008 and the 8080.

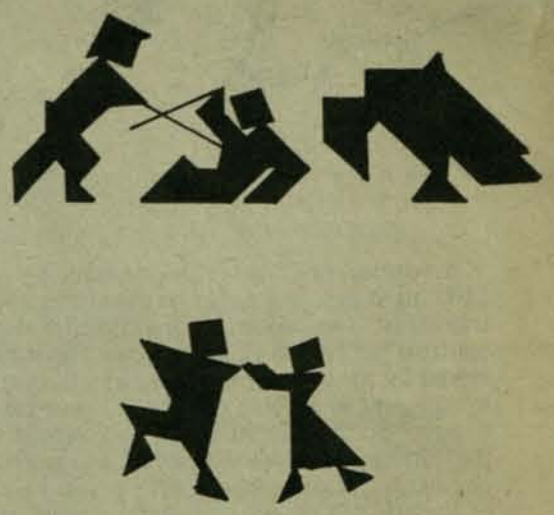
Terry F. Ritter
Dantco
2524B Glen Springs Way
Austin, TX 78741

COMPUTER PEOPLE – The Boston People's Computer Collective is a group of individuals interested in increasing laymen's awareness and understanding of the role of the computer in our lives. We are planning to offer courses exploring the possibilities of the computer, both as a tool and as a toy. We are also investigating setting up a traveling hands-on interactive computer exhibit that would appear in local schools and shopping centers. If you have any time, energy or ideas that you would like to share, please call Bill Mayhew, 617-522-4800, X25, 9 AM to 5 PM Monday through Friday.

WORKSHOPS SKILL BUILDING PAPERS

The 1975 North American Simulation and Gaming Association Conference will attempt to accommodate the variety of interests in the gaming and simulation field. Workshops and formal papers will be presented on design, application, theory and research. Experienced resource people will be available to help conference attendees deal with the problems of conducting and designing games/simulations.

The conference will focus on communication and participation, with many opportunities for attendees to meet and interact with each other in game and non-game settings. Those making presentations at the conference will have the option of reading formal papers or choosing from such other formats as gaming/simulation exercises, multi-media presentations, informal discussions and workshops. Papers are encouraged from all contributors including those persons making non-formal presentations; they will be used as a basis for discussions and will be published in the formal proceedings.



North American Simulation and Gaming Association
c/o COMEX PROJECT
University of Southern California
University Park
Los Angeles, CA. 90007

SUTHERLAND'S HELMET

TO: Fellow Freakie Fantasists
FR: The Fantom

A Piece Of Paper On The Possibility Of Using the HELMET Display System In Computer Games And Simulations

STEP 1... Get *Computer Lib* by Theodor H. Nelson; read the *Dream Machines* side. If you are currently poor, look at page 9 in the Jan. 75 PCC; read, especially the bottom right corner.

THINK . . . what could you do with a 3D perspective display????? Think . . . what is the neatest use computers do today????? think . . . PCC . . . peoples . . . aha!! you've got it ?? what is it ??? games . . . right you are. Sutherland's Incredible Helmet offers a degree of unrealism (or was that realism???*) never available before . . . a tremendous degree of interactivity . . .

START withsome staid, mouldy oldies of the computer game world, LUNER LANDER you say?? that's a good start . . . build a LEM. . . a Sphere for a body, paint the outside black. . . on the inside add standard spaceship stuff – life support, radar, pilot's chair. . . add weapons control and you have a warship . . . look out Captain Kirk – make a spacesuit for the pilot. . .use Sutherland's Helmet for his helmet... drive the whole thing with an Altair??? add a real-time perspective unit . . . from this one unit you can conquer space . . . Lander, Spacewar, Docking games . . . figure out software to make a moon, take the lander out for a cruise. . . landing on the moon – see the craters rush up at you . . . keep watching the radarscope for altitude . . . steer your lander into that large crater to the right . . . perfect landing??? watch the dust slowly rise, then fall back to the moon . . . take off again and try to dock with the command module . . . graphics on the same level as *2001* . . . too bad that we can't control gravity . . . design some kind of system to simulate space walks . . . the possibilities are endless – use this toy to teach relativity; as you approach the speed of light watch the stars red-shift – whoops . . . I added color – anything's possible.

Build a pair of tanks ??? how about a race car game? submarines ?? what about taking the airplane simulators one step farther by adding visuals ?? this is already being done . . .

ALAS AND ALACK
THERE IS A DRAWBACK . . .

$$$$$$$ and time and equipment and . . . there is always tomorrow???

In the meantime, there is a need for more stuff to make more games possible . . . one of the things needed most is a good joystick . . . with a joystick and a good display such as the one featured in the *Computer Hobbyist* (see the last line) we can do anything that Atari can doo . . . walk into your local game parlor and look around . . . those things with the coin boxes stuck on them are computers, and look at all the different games . . . baseball, race games (GranTrak 40), Tank, mazes, Space race . . . all of these games can be made on a computer with a joystick.

How about a good, cheap plotter . . . art freaks abound . . . let's put TV our of business . . . everybody run out and start your own PCC. enlist your local Ham Radio operators, a large body of talent waiting to be tapped . . . Hardware isn't hard . . . grab you a teacher . . . *this hobby is just starting and it is very hard to regulate it to death . . .*

(LAST LINE. The Computer Hobbyist, Box 295, Cary, North Carolina 27511)
DOWN WITH BOTCH COMPUTERS – UP WITH INTERACTIVITY.
COMPUTERS WERE NOT RAISED TO TALK FORTRAN AND COBOL

Build your own Star Trek and Spacewar games for fame and fortune. It is not very hard – Rule 1. Plan exactly what you want to include in the game before you begin. 2. Allocate all variables logically, ex. E is energy 3. If you expect it to be very complex, plan it as several programs that chain. 4. Do everything in subroutines. 5. 'stack' variables to conserve memory space. 6. allocate loads of time and patience to this task. 7. Use your imagination. These are some basic and obvious rules, but they are not absolute. In making a space game, there are 2 paths that are usually followed; (a) make it following the Star Trek programs Enterprise, following its design exactly, making the program very realistic. (b) Make it with anything you want to put in it. It is often a good idea to look at a well organized SpaceWar game to see how it was done. Make your own Star Trader or exploration or colonization game. These games are more difficult than a Spacewar game, but allow you a greater freedom of what you want it to do.

John A. McClenny – 5819 Brenda, San Antonio, TX
78240

Any comments would be appreciated. P.S. I am also working with a robot.

SHORT STAR TREK ANYONE?

I am president of the Homes Computer Club, Holmes High School, 6500 Ingram Rd., San Antonio, TX. 78238.

We use an HP2000/F computer, programmed for BASIC. Most of the members of the club are programming in BASIC, but a few, via the system's translators, are into COBOL and FORTRAN 4.

We are greatly in need of a shorter Star Trek program that has the basic format of HP's $STTR1, but doesn't take up 8000 some odd words of storage.

Chris Moseley
Holmes Computer Club
1927 Harpers Ferry
San Antonio, TX. 78245

10 COMMANDMENTS

10 BASIC is thy language. Thou shalt have no other languages before it.

20 Thou shalt not make thy loops infinite, nor return with no prior gosub.

30 Thou shalt not take the name of Hewlett-Packard in vain.

40 Remember the integrated circuits, to keep them holy.

50 Honor thy programming instructor, tho feeble-minded he may be.

60 Thou shalt not kil-other's programs.

70 Thou shalt not explore the insides of thy terminal with thy fingers.

80 Thou shalt not steal another program and call it your own.

90 Thou shalt not sabotage thy neighbor's programs.

100 Thou shalt not crash the Computer or in any way damage its hardware or software.

Robert "moses" Zeidman
9801 Clark St.
Philadelphia, Pa. 19115

STAR TREK and SICREC and . . .

You may remember me as the fellow who sent the letter asking if anyone wanted to trade Star Trek games. The response was slow, but fairly steady for several weeks. I was somewhat disappointed, however . . . I guess I overestimated how many active computer-oriented Trekkies there were. Somewhat surprisingly, most of the answerers were high school people. Made me feel kinda funny, being an old man of 28. Man, I'm American Graffitti revisited!

Got my copy of WTDAYHR (*What to do After you Hit Return*) and think it is very good, in general, Would have liked to see more listings, but I suppose there were problems with copyrights.

At any rate, to tell you a bit more about myself (there's a reason, later on), I got my MS in computer science in December, 74, with an option in operating systems and compiler theory. My undergraduate degree was in geography (that's right! geography!); I am now looking for a school at which to continue my PhD. I decided that I didn't really like my school at Lafayette, La, so I'm going to look at some various departments this summer, although most likely Texas A & M (ever heard of Aggie jokes? . . . something like Polish jokes). I was president of the student chapter of the ACM at the University of Texas at Arlington, the vice-president of Upsilon Pi Epsilon (National honorary society for Computer Sci) at UTA, and again last semester at USL. I turned down a nomination for the ACM at USL.

I told you all that (in a modest way, of course, aw schucks) so you might consider this: I'm considering trying to start a new subgroup in the ACM: SICREC, special interest committee on recreation and entertainment uses of computers. SICFUN?

SICREC could have several objectives: to provide a convenient games exchange center – to help legitimize the use of games since ACM has some 26,000 members of the computing community – to help hold down the cost of game software in the face of the ridiculous price spiral seen in software by the industry in the past several years – to promote the use of various higher level languages in games (I personally don't have anything against BASIC, but in a large system, where it's available APL is preferable, I feel (no, I'm not an APL freak). Home computing is an idea whose time has come. The introduction of hardware, typified by the Altair 8800 will lead to changes in the home environment of an unimaginable nature and incredible extent which would have been pure fantasy only 5 years ago. However, it's nice, once you have the system together, to be able to do something with it, especially as a learning process, and I feel that games are ideally suited.

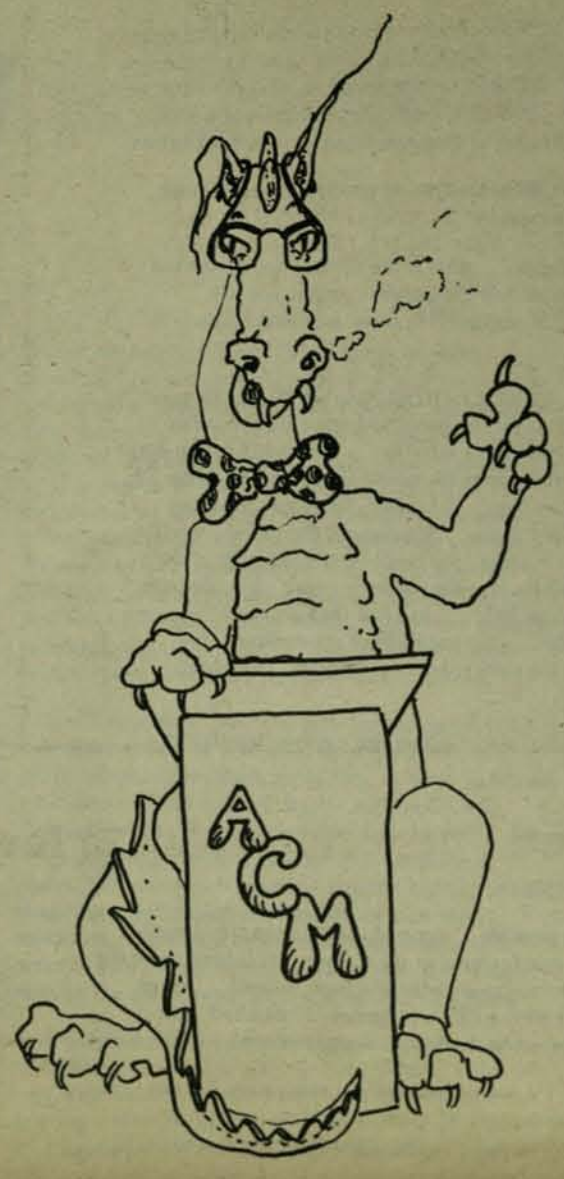
I can see several problems with copyright, and so forth, since there are only so many basic game structures, and infinite elaborations on these foundations.

Have you heard that there is a new magazine called BYTE slated for publication in August. It's from the publishers of 73 Magazine, the amateur radio publication. (I'm a ham, too – WB5KXH). And, of course, Creative Computing had appeared on the scene, so it appears there may be a scramble for this type of software. I definitely wish to keep hobby software at a friendly exchange level (I've heard of a Star Trek in the East that was being sold for $100 . . . I was AGHAST!), if at all possible.

At any rate, any suggestions you might have would be most appreciated. A few notes on other things:

I thought the story of the birth of the dragon in the last issue was most enjoyable, although I was rather disappointed to hear that you left Denver because of the industrial climate there. I love Colorado, and presently have a resume in at NCAR, in Boulder. I'm not firmly committed to a PhD at the moment, as it would be nice to go out and earn some money, but I really would like to get into something like PCC. Guess that California is several years ahead of the rest of the country, as usual. Sure wish there was something like it in Dallas, or Denver.

Robert R. Wier
1208 Mistletoe Drive
Fort Worth, TX 76110



TALKERS WANTED

As a student representative on the Student Affairs Committee, for ACM 1975, I would like to take this opportunity to ask you for some help in finding speakers for our Student Seminars. The Association For Computing Machinery (ACM) 1975 convention will be held in the Twin Cities on October 20-22, 1975. I hope you already know this and are planning to attend.

The Student Program for ACM '75 will consist of Student Paper Competition; Miscellaneous Activities, i.e., Computer Art, Computer Chess, etc.; and Student Seminars. We need people to commit themselves for speaking at these four forty-five minute sessions:

1. Historical Review of Standardization
2. Current Issues
3. Educational Opportunities
4. Career Opportunities.

If you are planning to attend the convention, and feel you can speak at one of these sessions, please contact me. If you know of anyone who might be interested in speaking at one of these sessions, please contact me, or if you like, contact them yourself. No fund are available to pay the speakers, and the sessions must not be commercialized. Thank you very much for your time. I hope to be hearing from you soon.

Wayne R. Asp
PROGRES Representative
ACM '75 Student Affiars Committee
1558 10th Ave. So.
Anoka, MN. 55303

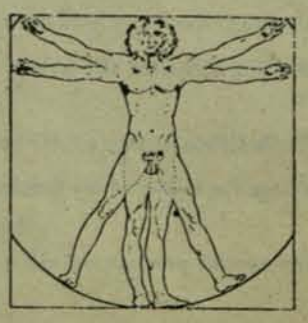
SOUTHEAST MINNESOTA AMATEUR COMPUTER CLUB

Three of us started a computer club in January by purchasing the Altair 8800 kit. We have grown to eight members just by word of mouth. We don't intend to advertise ourselves until we have a working system. While we have 4K of memory, a parallel I/O interface, an extender board, an audio tape interface, and edge connectors on order, we only have the Altair computer and 256 bytes of memory in our hands.

The kit went together easily and worked on the first try. We built it slowly with at least two members in attendance at each session. It didn't seem any more difficult to me than an audio signal generator kit from Heathkit I built a couple of years ago. We are generally satisfied with the quality of the components. There were only a few minor problems. Specifically – a few things didn't arrive with the kit and were listed in a cover letter, but the missing parts did arrive within two weeks; two of the ICs included were wrong, the first we caught ourselves and MITS called to tell us about the second before we got to it in the construction, both ICs were exchanged by MITS in about two weeks.

We don't know just what our final organization will be or just what all we will do with the computer, but things are happening too fast to plan very far ahead. We see four major applications areas: recreational, educational, personal business and household. My own interests are primarily in the first two areas as it appears so it is with you as well. The personal business applications could be anything from a check balancing program to a stock analysis and charting program. My wife has already asked me about two household applications – menu planning and inventory control for the pantry. Each of us in the club intends or hopes to get his own computer, but will want to remain in the club to use the specialized or occasional use of equipment and services we expect to offer thru the club. We expect to continue to own a club computer (or computers!) after we begin to get our individual ones. Quantity buying is another good example that the club could offer. For instance it looks as though we might be purchasing from three to five or possibly more computer systems at a time allowing the members to benefit from a possible quantity discount. We expect to add a PROM when our finances permit, which we could all use to good advantage. Certainly the club computer will be a relatively powerful one allowing members to start with a truly minimal system and use the club computer for advanced functions such as assembly, compiles, and hard copy printout – the last assumes that the user has no printing device or too slow or small a one for what he has to do. We have already found it most reassuring to find so many other friendly helpful people, expecially with skills and talents we lack. The best analogy so far to what is happening in amateur computers is amateur radio. However, the function of such clubs in the amateur computer field has not been appreciated until now.

Daniel Nicholson, President
SEMACC
2122 NW 17 Avenue
Rochester, MN 55901



"I'd like a computer that's about this high and this wide..."

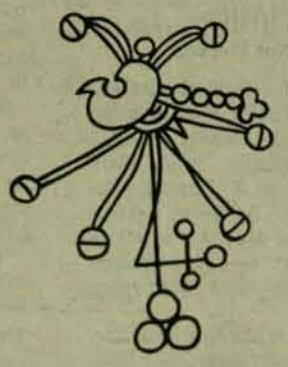
The Mits-Mobile is a camper van completely equipped with an Altair BASIC language system. Included is an Altair Computer, Comter terminal, ASR-33 Teletype, Altair Line Printer, Altair Floppy Disc and BASIC language.

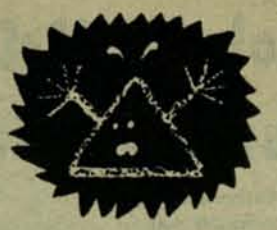
If you want to find out when the Mits-Mobile will arrive in your hamlet, write to Mits-Mobile, 6328 Linn NE, Albuquerque, NM 87108 or call (505) 265-7553.

A nice poster titled "lucid Dimensions" by Bay Area illustrator, Clifford Spohn is available and free from:

Advertising
Memorex Corporation
San Tomas at Central Expressway
Santa Clara, Ca. 95052

They also throw in a couple of Memorex posters.





Program Style, Design, Efficiency, Debugging and Testing
by Dennie Van Tassel Prentice-Hall $10.95

This is a good book for those with some programming background who wish to improve their skill. The book is chock-full of hints on the topics in the title. Finally, it has one of the largest selection of programming problems available in any book.

James Douglas
531 Easterby
Sausalito, Ca. 94969

MID-MICHIGAN MICRO USERS GROUP

I'll be going to Michigan Technological University this Sept. and will send you the mailing address when I get it. I would appreciate any MTU computer freaks writing me, thanks.

I'm glad to see PCC get into hardware, expecially Vol. 3 No. 3. I want to see PCC get a BASIC compiler or interpreter going. I'm going to try and write one from the University of Illinois report. It'll be a long road. I like Tiny BASIC for a starter. Do you think it would be possible in 2–3K? Yup – next issue!

What is the address of the Rienold Publishing Co. with the book *Anatomy of a Compiler*? VAN NOSTRAND REINHOLD, 450 W. 33RD. ST., NY 10001

Good News! Bill Serviss in Dewitt, Mich. has started the "Mid-Michigan Micro Users Group." He found me through my last letter in PCC. There are about 12 people in the group. It is growing. Bill has a modified Mark-8 he built on perf board. He has a ¼k at the moment. Three or four more members plan to build Mark-8's.

As I told you in my last letter I was building a Mark-8. With Bill's tender care it did work for a while. Hopefully by the end of the summer I'll have enough dough scrapped together to have a 5K Mark-8, with TV typewriter, ASCII keyboard, cassette interface and BASIC or FORTRAN software.

Larry Miller
826 Halstead Blv.
Jackson, MI 49203

COMPUTER ART CONTEST

Two double winners were produced in the seventh annual computer art contest sponsored by the Kiewit Computation Center at Dartmouth College this spring.

At recent informal ceremonies, Math Prof. Thomas Kurtz, director of the computation center, awarded prizes to the following:

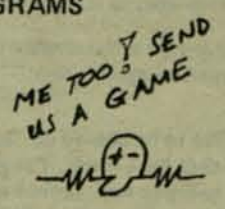
James Browning, a Dartmouth freshman from Hanover, who won the first prize of $75 with a dramatic audio-visual presentation entitled "WHE" and who tied for second prize and a $50 award with an untitled entry depicting an interacting flow of colors;

Robert B. Clyman, a sophomore from Great Neck, NY, who shared second place honors and also received a $50 award with a lovely geometric design entitled "BLOSSOMS";

Lynn Brooks, a junior from Grand Rapids, Mi, whose stylized representation called "PONIES" took third place and a $25 award and whose second entry entitled "OWLS" received honorable mention; and

Kevin U. Cohan, a freshman from Sydney, Australia, whose untitled work also received an honorable mention.

WANTED: GAME PROGRAMS



I'm interested in good, unique, and comprehensive game program – mainly my subject of interest are –

sports simulations (baseball, hockey etc.)
card game simulations
table game simulations (monopoly, etc.)
spacewar games

or any other interesting program. I'm a programmer who has taken game programming as my hobby. I have lots of spare time to work on program, so just send me listings since I don't mind typing in programs that interest me.

Thanks, and send them to:

Gary Trapp
310 Julian St.
Denver, Co. 80219

WANTED:8008 BASIC

I am currently working on an RGS-008A micro (8008 based) and already have the TVT I built with some mods (send them in when I get them working decent) and a cassette interface (RGS design).

I'm a senior at Purdue in EE with strong interest in CS. I'm also President of our ACM. As soon as I get them modified off our tape, I'll send you our complete game file and some of our better pictures.

Hurry with the BASIC interpreter for the 8008. Any problems I become aware of, I'll put on our University Computer Mail service, which includes undergrads, grads, profs, (all interested in software or hardware) along with all our system programmers.

Fred Rosenbaum
1-7 Ross Ade Dr.
West Lafayette, IN 47906

See page 12, this issue.

Technology, McDonald's Collide As Students Best Burger Bonanza

By Catherine Arnst
Of the CW Staff

PASADENA, Calif. – McDonald's Restaurants, whose hamburgers have taken their place along with Mom and apple pie as a piece of Americana, was recently confronted by a computer and 26 students from the California Institute of Technology (Cal Tech) following another American tradition – free enterprise.

It started when 187 McDonald's in five counties of southern California held a sweepstake during March. The $40,000 worth of prizes included a new sports car, a year's free groceries, a station wagon and free McDonald's coupons.

Entrants were required only to be a resident of one of the five counties and fill out either an entry blank or a three-by-five piece of paper with their name and address. No purchase was required and there was no limit to the number of times each person could enter.

The Cal Tech students, headed by senior John Denker, realized these rules presented them with an opportunity to turn their DP training to a money-making advantage.

The students used the school's IBM 370/158 to print out 1.2 million entry blanks with their names on them. Denker said enough paper was used to cover "two and one half football fields or [reach] higher than a three-story building."

The program they wrote consisted of four simple lines of Fortran. Although Denker admitted it probably would have been more practical to have a regular printer do the entry blanks, the students

(Continued on Page 4)

had ready access to the computer and it was faster.

On the final day of the contest the students went to 90 McDonald's in the specified counties and started stuffing the entry boxes. Their computerized entries made up over one-third of the 3.4 million total number of entries.

McDonald's Not Pleased

McDonald's was not delighted with the students' high level of participation in the sweepstakes. Although Denker claimed their entries are legally valid, Ron Lopaty, president of the McDonald's Operator's Association of Southern California, said he feels "the students acted in complete contradiction to the American standards of fair play and sportsmanship."

The contest's purpose, he said, was "to give customers an opportunity, in a time of economic stress, to win free groceries and transportation. So you can understand our displeasure when their chances of winning were greatly reduced by the Cal Tech students using an unfair advantage of computerized entry blanks."

Part of the public agreed with him in letters and phone calls to both McDonald's and Cal Tech. The state's attorney general even received a petition signed by over two dozen southern California residents which said "the use of equipment at a state or federally funded college, university or institution for the pursuit of personal interest, not to mention cheating American consumers, is an absolute outrage."

As for Cal Tech, it has taken no position on the issue, claiming it was the students' private endeavor.

Lopaty said McDonald's has agreed "to honor as 100% valid all the Cal Tech students' 1.2 million computerized entries" and, in fairness to the other entrants, will hold a second drawing in which all the computerized entries will be excluded and duplicate prizes of any won by the students will be awarded again.

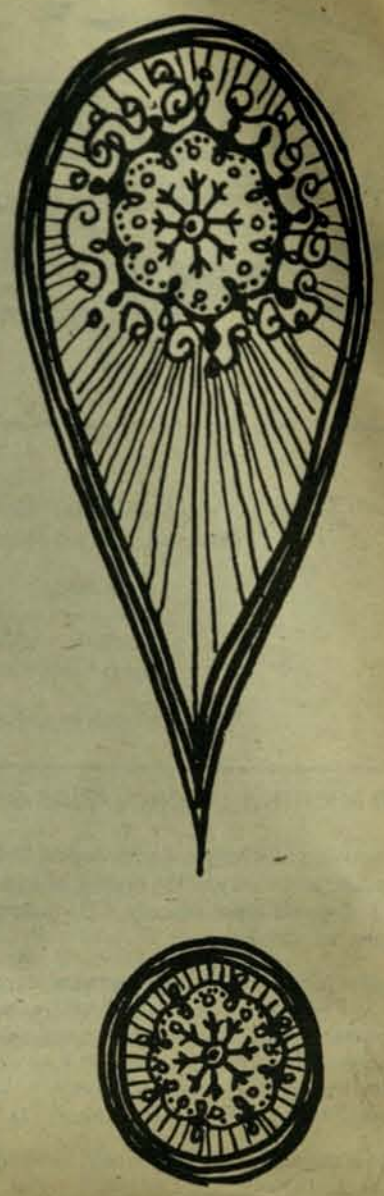
For the students, the McDonald's caper, as they call the affair, has paid off. They have already been notified they've won a Datsun 710 station wagon, a year's free supply of groceries and innumerable $5 gift certificates.

"Part of the loot will be used to finance improvements in Page House, our residence here at Cal Tech," Denker said. "The rest will be donated to charity."

Denker was dismayed at the restaurant chain's reaction to the incident, saying he doesn't feel they violated American standards of fair play.

"Just because it is unexpected doesn't mean it's unfair," he explained. "We feel that by accepting the challenge to enter as often as you wish, we have acted in accordance with the best ideals of American sportsmanship."

There are those who agree with him, and Cal Tech garnered a prize of its own from one of them. The Burger King chain of restaurants, McDonald's arch rival, has awarded $3,000 to the school to set up a "John Denker Scholarship" in honor of the student who masterminded the scheme.



MANTRA

The Prayer wheel programs I mentioned in an earlier letter will be released shortly – as soon as I get time to make 'em pretty. These are PDP's (Public Domain Programs) that were written in 360 assembler, so they should run on any 360, 370 or a Spectra machine.

Program 1 is named DISCMANT. The current version is device-dependent. It writes a single logical record that fills an IBM 2316 disk pack track (7294 8-bit bytes) with 405 catenated copies of the 18 character (EBCDIC) string –

'OM♭MANI♭PADME♭HUM'

To pad out the last 4 bytes, 'OMOM' is used.

After the string is written, the data set it comprises will stay on the disc volume until it is scratched. Meanwhile the disc pack is spinning away, whether or not the CPU is operating . . . cranking out over 10^9 PRE's per day. (A PRE is a 'prayer-revolution – equivalent is a measure of prayer-wheel performance. a PRE is defined to have the same effect as the physical rotation thru 2π radians, of a theologically acceptable graphic representation of the Tibetan Buddhist mantra

OM MANI PADME HUM.

(invented it myself, I did)).

It's a good idea to put this on a "public" or "system-resident" volume – a volume that's mounted all the time . . . evidently the thing is to keep a prayer wheel spinning all of the time.

Program No. 2 is named OM. Essentially it keeps the same mantra circulating in the four floating point registers (again, 360) in a tight loop – runs until time for job (or job step) is up . . . at which time the OS grabs control and bombs the program. This insures that the time the user requests is spent running the mantra around rather than in "cleaning things up", as "good programming practice" would dictate (closing data sets, returning control to OS, etc., etc.).

I don't think it's as useful as DISCMANT (for DISC MANTra) but who knows?

I'm not a Buddhist myself – the person I wrote the programs for is. I'm not exactly sure what a prayer wheel does – except that what ever it is, these programs seem to do it – or so I have been assured by the person who asked me to write them.

You'll get one source deck plus "assembly, link-edit and go" listing per program.

If anybody wants, I'll supply source or object modules (card or 9 track tape, Std label, even parity) for cost of job plus materials and postage.

Why haven't the Tibetan Buddhist monasteries picked up on this? I'd be super cheap – it's just a dense storage medium and all you have to do is spin it – no I/O required, so (Look, Ma!) no beads . . .

Both program thoroughly documented – not all computer jargon, either.

I'd like to be able to do "socially redeming" things like that for a living. I'm getting to the point where I'm going to have to find work . . . I'm taking COBOL –a draggy language– and I'm totally turned off to the business world. I'd like to find a job doing meaningful user-service-oriented (or systems, utilities, networking, graphics) computer work. If anybody out there is looking for a good software ex-hardware (but not turned off to same) person, please contact me. I know the following languages in and out –

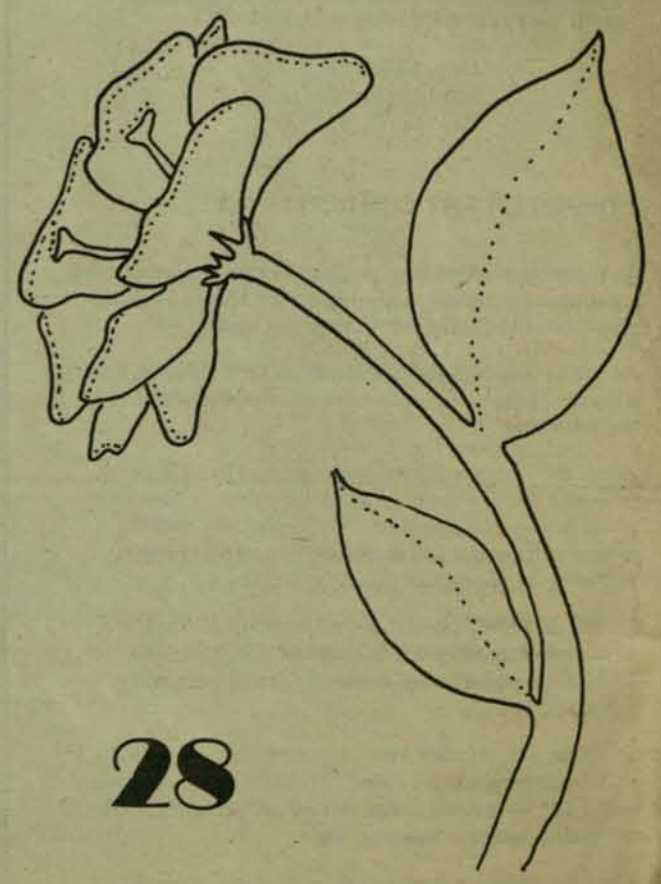
360 Assembler + macro langauge – written some nice system and user utilities, and OS/MVT system mods.
FORTRAN IV + Calcomp plotter – wrote a batch LIFE program, lots of options.

Less well, but have written and debugged programs in –

MIXAL	NASIC	BASIC
Turing machines	360 JCL + PROCS	
COBOL	LISP	
PL/I	APL	

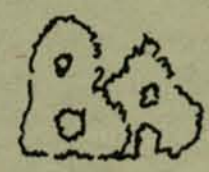
I think I'm creative and resourceful enough to do such a job (but I don't feel creative and resourceful enough to find one – not without feedback enyway) . . . and hopefully contribute to the demystification of computers.

Kurt Cockrum
"People's Free Bit Crunching Facility"
3398 Utah
Riverside, Ca. 92507



Dragon Books

Hi mortals. Here are some of the things I peruse each month for information, inspiration and entertainment.



NEWS OF THE TRADE

Magazines, newspapers, etc. Some free (to "qualified individuals"), some expensive some in between. Write for info.

* COMPUTER DECISIONS
Hayden Publishing Company
50 Essex St.
Rochelle Park, NJ 07662

* COMPUTERWORLD
797 Washington St.
Newton, MA 02160

* COMPUTERS AND PEOPLE
(Formerly Computers and Automation)
Berkeley Enterprises
815 Washington St.
Newtonville, MA 02160

* DATAMATION
Technical Publishing Co.
35 Mason Street
Greenwich, CT 06830

* INFOSYSTEMS
Hitchcock Publishing Co.
Hitchcock Bldg.
Wheaton, IL 60187

* MODERN DATA
P. O. Box 369
Hudson, MA. 01749

* MICROCOMPUTER DIGEST
2368–C Walsh Ave.
Santa Clara, Ca. 95050

* MINICOMPUTER NEWS
Benwill Publishing Corp.
167 Corey Road
Brookline, MA 02146

HOBBY STUFF

If you are building your own, you probably will like these –

* Computer Hobbyist
Box 295
Cary, NC 27511

* Electronotes
B.A. Hutchins
60 Sheraton Drive
Ithaca, NY 14850

* MICRO-8 NEWSLETTER
Cabrillo HS
4350 Constellation
Lompoc, Ca. 93436

Electronotes specializes in electronic and computer music. The *Computer Hobbyist* and the *Micro-8 Newsletter* cover hardware, software and applications for home and personal computers. And . . . starting in September,

* BYTE
Peterborough, NH 03458

INSPIRATION

If you like games or simulations or math recreations or . . . try the following

Flying Buffalo's Favorite Magazine
P. O. Box 1467
Scottsdale, AZ. 85252

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Simulation/Gaming/News
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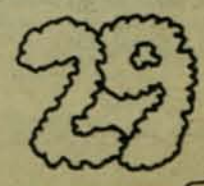
* Computer Notes
MITS, Inc.
P. O. Box 8636
Albuquerque, NM 08708

* EDU
Digital Equipment Corp.
Maynard, MA 01754

* HP Educational Newsletter
Hewlett Packard
11000 Wolfe Road
Cupertino, Ca. 95014

Least Expensive BASIC?

Until September 15, 1975, you can buy an 8K ALTAIR 8800 kit, complete with BASIC, for $995. Add the terminal of your choice and start computing. For more info, write MITS, 6328 Linn NE, Albuquerque, NM 87108



Book Reviews

how two ex-students turned on to pure mathematics and found total happiness

SURREAL NUMBERS

a mathematical novelette by D. E. Knuth

What's half of infinity? What is less than 2 but neither <0, =0, nor > 0? Answers to these and other mystifyiers are revealed in **Surreal Numbers**, a mathematical novel-in-dialogue by Don Knuth of Stanford's Computer Science Department.

The story tells of Bill and Alice, dropped out and isolated by choice on a remote beach by the Indian Ocean. In a moment of boredom, they uncover an ancient stone revealing the fundaments of a new number system designed by J. H. Conway of Cambridge University. Together, they turn on to evolving a theory of Conway's numbers, and the reader follows their adventures and frustrations as they start with nothing and together create a variety of appealing notations, the entire set of real numbers ... and more.

Familiarity with algebra, set notation, induction and deduction are the only prerequisites to appreciation of this entertaining story. It is best read quickly in one or two sittings, with out dwelling on the detailed steps of proofs. The exciting discoveries are at the end, and enough can be picked up in a quick reading to understand them. If you later find your thoughts filled with Conway numbers, many of Alice and Bill's discoveries cry out for formal proofs, and if further relief is needed, there are 22 explicit excercises in the back. From there, you can carve out your own branch of the new theory.

Knuth —— an energetic mathematician, computer scientist, teacher, writer, organist and sage —— likes to turn people on to elegant thinking, and in this book goads the educational establishment to follow suit. His closing words might well be stamped on the walls of every math, science, and engineering classroom in our universities:

In my opinion, the two weaknesses in our present mathematics education are the lack of training in creative thinking and the lack of practice in technical writing. I hope that the use of this book can help make up for both of these deficiencies.

It's a good start.

Larry Tesler
Menlo Park, Ca.

Surreal Numbers by D. E. Knuth
1974, 119 pgs., **$3.95.**

Travels in Computer Land by Ben Ross Schneider, Jr.
1974, 224 pgs., **$5.95**

These two books are available from:
Addison - Wesley Publishing Co., Inc.
Reading, Ma 01867

TRAVELS IN COMPUTERLAND;

OR,
INCOMPATIBILITIES *and* INTERFACES

A *Full and True* Account of the IMPLEMENTATION of the *LONDON STAGE* INFORMATION BANK

by a Professor of *English*
BEN ROSS SCHNEIDER, Jr.
M.A., PH.D., F.R.S.A.
Written by
HIMSELF

This book describes the experiences of a university professor who embarks on a computer project. He starts as an innocent and ends pretty much the same, though with his mind and vocabulary somewhat broadened by the experience. The book is not a textbook, nor notably informative about computers, though there are undoubtedly unfortunates for whom it would have been extremely valuable. Its instructional merit will be appreciated by those with comparatively ambitious projects and large systems, but its real attraction is as literature.

The author writes from the detached viewpoint of a scholarly observer. His reflective and introspective style belongs to a long vanished, more leisured age, but the gentle humor with which he regards both himself and his surroundings does not disguise the almost crystalloid precision of a highly trained mind. His perceptive observations sometimes flash with insights well worth consideration, especially by those whose understanding of computers and computer people is extensive.

In short, the book is a two way window. Those with no knowledge of computers may peer through it at a strange landscape -- computer people may find through it much that is strange in farmiliar surroundings. One warning, though, the reviewer is an Englishman.

Keith Britton
Loma Mar, Ca.

TEACH YOURSELF
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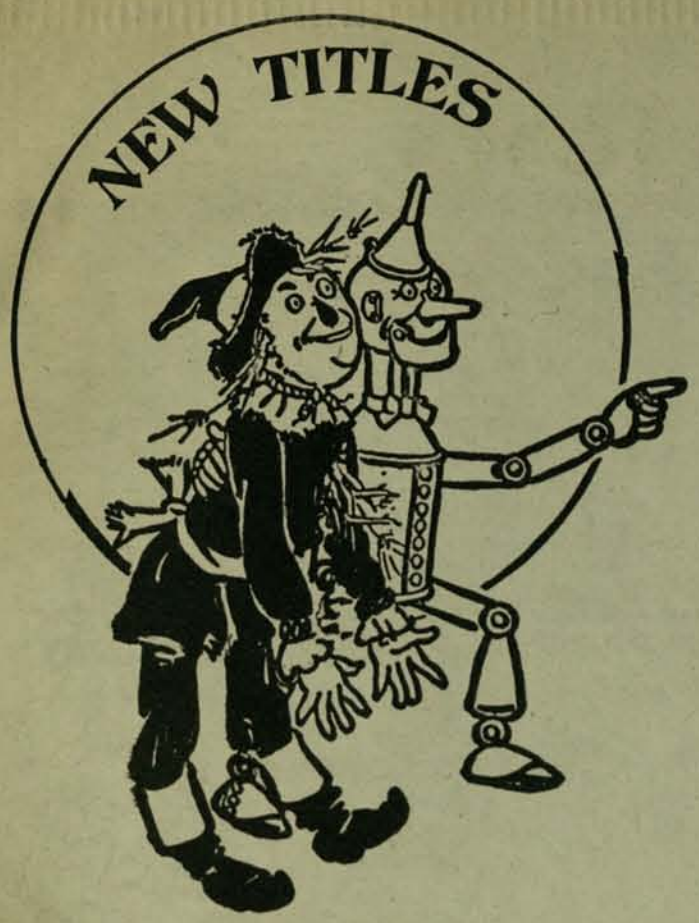
EDUCATION CORPORATION

now available at:
PCC Bookstore

One of the first BASIC primers to receive wide acceptance in the junior high and high school market has been revived by PCC bookstore. **Teach Yourself Basic I & II** was written in 1970 by your friendly dragon for Tecnica Education Corporation (remember them?). Written at about an seventh grade math level, it received immediate acceptance for use in grades 7 - 14. It nearly disappeared when Tecnica moved to Utah, but we just found it again and offer it to you. Book I covers teletype fundamentals and BASIC instructions: LET, PRINT, GO TO, FOR NEXT, INPUT, and a few other fundamentals in that popular "read it and try it" style. Book II deals with IF THEN, ARRAYS, and other seemingly more sophisticated instructions for the novice. When you buy it, you may recognize that **Teach Yourself Basic I & II** have been reproduced in their entirety by DEC in EDU Handbook. This form of the book is an alternate way to buy this product. The price is right, the quality there. Try it... lots of others have liked it.

Leroy Finkel
Menlo Park, Ca.



My Computer Likes Me will go up to $2.00 on September 1st, so buy now!

Teach Yourself BASIC I & II

Bob Albrecht, 1970, p. 64 – $1.95 each
Published by TECNICA

Fun And Games With The Computer

Edwin R. Sage, 1975, p. 351 – $5.95
Published by ENTELEK

BASIC, Albrecht, Finkel & Brown, 1973, p. 323 – $3.95
Basic BASIC, James Coan, 1970, p. 256 – $5.95
BASIC PROGRAMMING, Kemeny & Kurtz, 1967, p. 145 – $6.95
COMPUTERS & COMPUTATION Scientific American, P. 280 – $6.00
COMPUTER LIB & DREAM MACHINES, Theodore H. Nelson, 1974, p. 186 – $7.00
DRAGON SHIRTS, Nancy Hertert, 1974 – $3.50
GAMES, TRICKS & PUZZLES, Wallace Judd, 1974, p. 100 – $2.95
GIMME SOMETHING TO FEEL, Jane Wood, 1973, p. 125 – $2.95
MATH WRITING & GAMES, Herbert Kohl, 1974, p. 252 – $2.45
MY COMPUTER LIKES ME, Bob Albrecht, 1972, p. 64 – $1.49
101 BASIC GAMES, Ed. David Ahl, 1974, p. 250, – $7.50
PROBLEMS FOR COMPUTER SOLUTION, Gruenberger & Jaffray, 1965 – $7.25
PROFESSOR GOOGOL, Sam Valenza, Jr., 1973, p. 144 – $3.25
PROBABILITY, D. J. Koosis, 1973, p. 163 – $2.95
PCC GAMES, Program Listings – $2.00
SELLING WHAT YOU MAKE, Jane Wood, 1973, p. 111 – $2.25
STATISTICS, D. J. Joosis, 1972, p. 282 – $3.95
TTL COOKBOOK, Don Lancaster, 1974, p. 328 – $7.95
II CYBERNETIC FRONTIERS, Stewart Brand, 1974, p. 96 – $2.00
WHOLE EARTH EPILOG, Stewart Brand, Editor, 1974, p. 318 – $4.00
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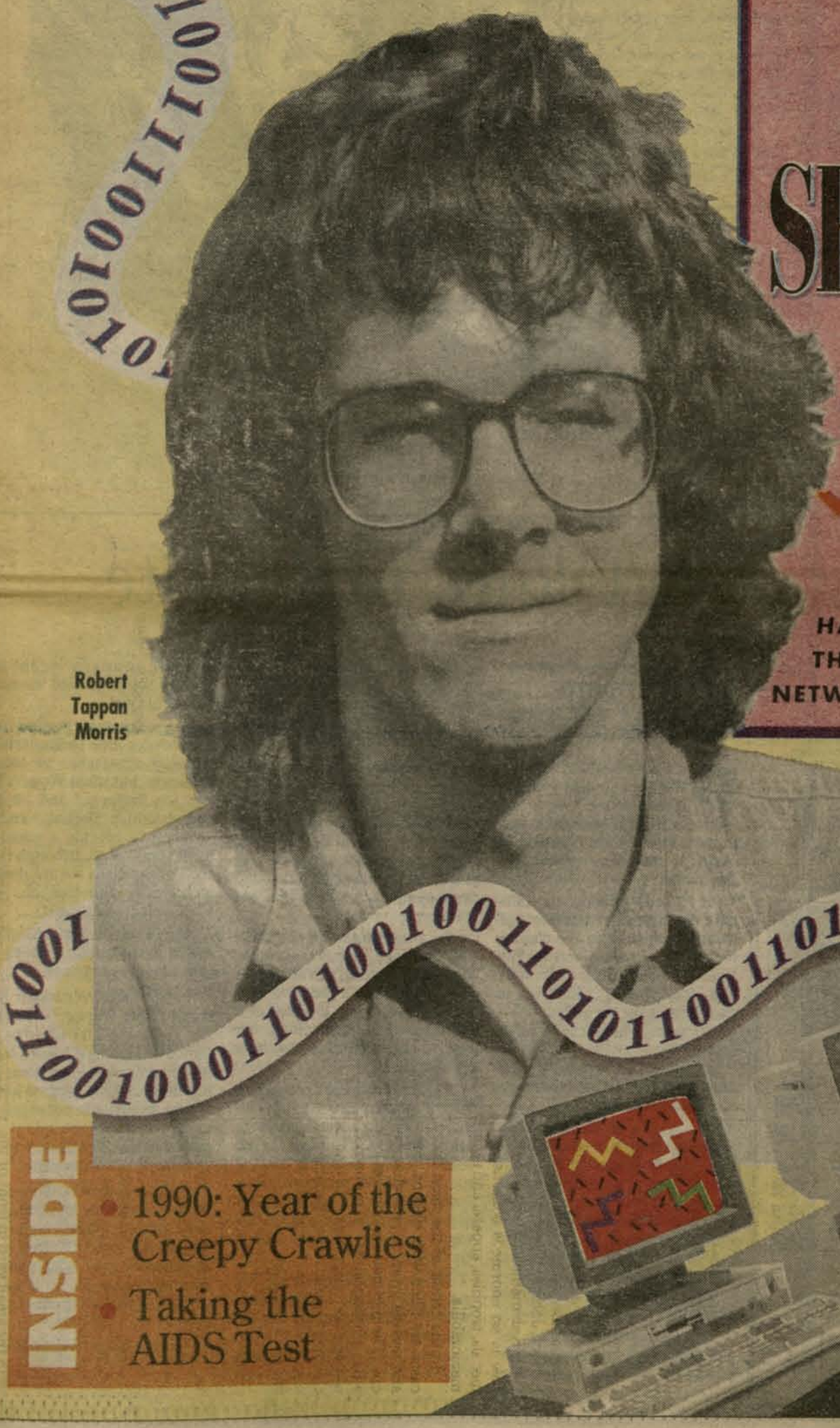
San Francisco Chronicle

This World

July 8, 1990



Robert Tappan Morris

THE SHOCKWAVE RIDER

INSPIRED BY A SCI-FI HERO, A YOUNG HACKER CREATED A 'WORM' THAT PARALYZED COMPUTER NETWORKS ACROSS THE COUNTRY

INSIDE

- 1990: Year of the Creepy Crawlies
- Taking the AIDS Test

DESIGN BY ERIC JUNGERMAN/THE CHRONICLE

This World

JULY 8, 1990

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A SECTION OF THE SAN FRANCISCO EXAMINER & CHRONICLE

THE NOW SOCIETY *Wm. Hamilton*

When you think of me, think four-wheel drive

Send 'Ring' to Rewrite

Modern opera
RUSSELL BAKER

Dear Herr Wagner:
We have studied your so-called "Ring" cycle of four operas, all 17 hours of it, and propose the following changes to make it suitable viewing for Americans:

1. Rewrite opening to eliminate the insensitive treatment of dwarfs embodied in the character of the dwarf Alberich. The Rhine Maidens' calling him ugly and toad-like is offensive to dwarfs, as is the suggestion that a dwarf cannot be sexually interesting to mermaids. Having Alberich steal the Rhine gold imputes criminal instincts to dwarfs and is an overt slur.

We suggest changing the plot to make Alberich so irresistible to the Rhine Maidens that they compete to give him the Rhine gold. However, if your plot requires Alberich to steal, you must enlarge him to avoid any hint of dwarfism. Better make it clear, too, that he is an Episcopalian, perhaps by costuming him in a prep-school blazer.

2. As now written, Wotan, the chief god, may be interpreted as irreligious, since you portray him as greedy for expensive real estate, quick to swindle his contractors out of their pay, and willing to trade his sister-in-law to giants in exchange for their labor.

Incidentally, the suggestion that giants will accept a beautiful sister-in-law in lieu of cash is an insensitive slur on giants and must be cut. We suggest you shrink the giants and make it clear that they are Episcopalians, perhaps by giving them BBC accents.

To avoid offending the most boycott-prone religious groups, we suggest cutting all references to Wotan's being a god. You may make him, instead, the boss of a big crime family, provided you make it absolutely clear that he is an Episcopalian.

3. Eliminate sexist portrait of Fricka as a jealous, nagging and murderous wife determined to make Wotan's life miserable unless he agrees to kill his bastard son. Instead, you might make her a working mother whose big angry-outburst number accuses Wotan of not doing his share around the house.

Then, instead of forcing Wotan to kill his son, the scene ends with Wotan trudging off to wash the dishes in tribute to Fricka's feminist power. Make it clear that Fricka is not an Episcopalian, perhaps with an aria saying she never had a scullery maid when she was a little girl.

4. Speaking of bastard sons (see above), a little philandering is perfectly acceptable to today's audiences, but when Wotan's bastard son Siegmund and his bastard daughter Sieglinde engage in incest to provide a grandson for Wotan — well, although these are Episcopalians we are dealing with, even Episcopalians can have their feelings hurt.

Cut the incest. Make Sieglinde a dull Episcopalian girl of the crime family next door.

5. No more overweight Siegmunds, Herr Wagner, if you persist in having him lose the big fight with Hunding. Health bigots in the audience will go home saying Siegmund lost because he was too fat to fight. Encouraging an inference that rotund people can't fight is insensitive to the feelings of the overweight.

6. Cut business of Wotan punishing Brunnhilde by making her sleep inside a magic ring of fire. Encourages small children in the audience to play with matches. Also invites people to think it's OK to foul the environment with smoke.

Cut the magic ring of fire and

See Page 6

Sex Through the Ages

Page Smith
COMING OF AGE

Like any normal 72-year-old male (or, for that matter, any normal 22-year-old or 42-year-old male), I am obsessed with sex. My principal advantage over younger males with the same obsession is that I have been obsessed longer and meditated more on the subject and have had time to observe more of my countrymen's (and, to a somewhat lesser extent, countrywomen's) behavior regarding this complex issue.

My credentials for dealing with the subject in a definitive way are strengthened, I believe, by the fact that I have lived through three strikingly different fashions in sexuality. My father was a product of the sexual revolution of the early decades of the present century (there had been a previous one in the 1870s). He was a notorious libertine and womanizer, one of those late Victorians who, like many of his generation, felt confident that he was blazing new paths of sexual liberation.

I was born in one of those periods of reaction that invariably (and fortunately, in my opinion) follow periods of sexual excess. (If that were not so, the world might have dissolved in a universal orgy long ago.) I grew up in much the same atmosphere as that described by Joseph Alsop, an era that Alsop calls "the WASP Ascendancy." I was, to be sure, a humbler WASP than Alsop, but the same general principles prevailed.

Sexual matters were never discussed openly. There were various code words, mysterious hints and allusions. Young men and, much more important, young women, were expected to remain virginal until marriage. Fear of pregnancy with nice girls and fear of disease with not-nice ones were inhibiting factors. Sex was not generally sought with "nice girls," who were considered, probably correctly, to be relatively sexless. Only "loose" women were to be seen on the street without hat and gloves.

If a woman smoked in public, it was considered mildly scandalous, "fast" if not "loose." If a woman was too "fast" too long, it was assumed that she was "loose." Lingerie ads were a major source of sexual titillation; "a glimpse of stocking was looked on as something shocking," as Cole Porter put it. The tone was repressive. A woman friend once told me that her mother had confided to her that when she was married, she had no idea how babies were conceived. Until she was in her late teens, she thought it was from kissing.

It was a time of inhibitions and restrained behavior. In my opinion, it worked reasonably well. We all understood that sex was a powerful, dangerous, mysterious force that would get us in deep, deep trouble if we didn't watch our step. And by and large, with the inevitable slips here and there, we watched our step. I assume that we were as sex-obsessed, that we had as many fantasies about sex as our counterparts in any other generation since the beginning of the race. But we lived in a society that had taken some of the disruptive force out of sexuality by a constant round of supervised social activity that kept sexual intensity to a low level.

I was born in one of those periods of reaction that invariably follow periods of sexual excess. (If that were not so, the world might have dissolved in a universal orgy long ago.)

I certainly don't look back on my youth as any kind of golden age, sexually speaking. I just think it was infinitely easier on everyone than the present catch-as-catch-can situation, and much less socially disruptive. I wouldn't recommend going back to those days even if we could. For one thing, fearful men had so thoroughly suppressed feminine sexuality, at least within the existing class system, that many young women were hardly aware that they had bodies and sexual needs. That was not healthy, and it militated against sexually fulfilling marriages. If sex is suppressed within marriage, it is inclined to pop up outside marriage — and it frequently did.

That the sexual atmosphere has changed considerably is a point that hardly needs to be labored. Starting in the late '50s, Americans rediscovered sex, not for the first time, but with an ardor never before displayed.

Americans have been embracing various universal panaceas since the beginning of the republic — temperance, abolition, women's suffrage, vegetarianism, socialism, and on and on. The advocates of each new cause (or old cause renewed) promise the millennium once their particular panacea has been adopted. The champions of sexual freedom were, in this respect, no different from their fellow panacea pitchers. The practitioners of sexual freedom were promised not only new heights of ecstasy but a more abundant life in general — better health, a cheerier outlook on life, an end to war ("Make love not war"), lower taxes and a cleaner environment.

Things haven't worked out entirely as planned. Instead of a more abundant life we have more abundant sexually transmitted diseases, more divorces, more unwanted pregnancies, more abortions, more drugs and more general social demoralization. ■

Page Smith, 72, is an eminent Santa Cruz historian. His most recent book is 'Killing the Spirit: Higher Education in America' (Viking). © 1990 Chronicle Features.

Don't Believe Everything You Read

Andy Aaron and Eddie Stern
BUSINESS

In the course of a 73.5-year lifetime, the average American will spend:

7 years in the bathroom
5 years waiting in line
2 years trying to make phone calls to people who aren't home
1 year searching for objects they've misplaced
8 months opening junk mail

From Spy Magazine. © 1990 Spy Publishing Partners, L.P. Distributed by United Feature Syndicate.

These factoids, from a press release sent out by the Pittsburgh consulting firm of Fortino & Associates, have appeared in the New York Times (including the Op-Ed page), the Wall Street Journal, USA Today (twice), *Business Week*, *Psychology Today*, *Premiere*, the Chicago Tribune, *Self*, the Chicago Sun-Times, the Harper's Index and George Will's syndicated column. Also on NBC, CBS and ABC News, "The Tonight Show," the "Today" show and "Good Morning America." The item has been reprinted wherever column space is filled with neat little stories about the wacky world we live in — which is to say, just about everywhere.

As Larry Speakes, Ronald Reagan's press secretary, said, "If you tell the same story five times, it's true." So this story must be really true — after all, it passed unscathed through the fact-checking procedures of so many reputable news organizations. Surely so many writers and editors couldn't have reported information that was the result of someone's having hit the wrong button on his calculator!

After a grueling four minutes with our own calculator, we broke the alleged "lifetime" statistics down into their daily quotas. According to Fortino's data, we learned that the average American spends, every day:

2 hours 20 minutes in the bathroom
1 hour 40 minutes waiting in line
40 minutes trying to phone people who aren't home
20 minutes searching for misplaced objects
15 minutes opening junk mail

This was news. Has anyone outside of Eastern Europe actually waited in line 1 hour and 40 minutes a day, seven days a week, from infancy until death? After all, the Stones don't go on tour that often. And does everyone really spend 40 minutes a day trying to telephone people who aren't home, when such calls are necessarily awfully short?

Don't forget, these are supposed to be average figures. So if you think you're spending only 30 minutes a day in the bathroom, then someone else must be spending three or four hours in there.

Wondering if we, the editors of *Spy* magazine, were the only people in the United States who feel that 15 minutes a day is an exceptional amount of time to spend reading Publishers Clearinghouse Sweepstakes literature and invitations to visit time-share condominiums, we called Fortino & Associates president Michael Fortino and asked if something was perhaps wrong with his figures.

"Wait a minute," he said, apparently without irony. "Do you have industrial analysts going out and taking data that contradicts ours?"

We reassured him that we were acting on our own, that it just seemed like most people we knew spent about 30 seconds daily slipping unopened junk mail into the garbage. "You may not open junk mail, but other people do," he replied. His statistics, he went on to explain, are based on phone polls, on the use of Nielsen-type families who agree to record their actions in a diary, and on "time-and-motion studies" wherein analysts put a stopwatch on regular, obvious citizens in

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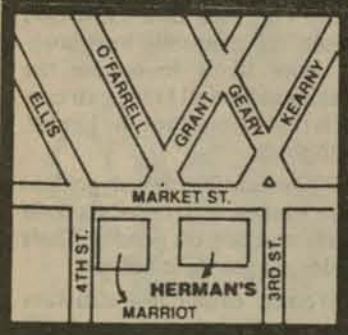

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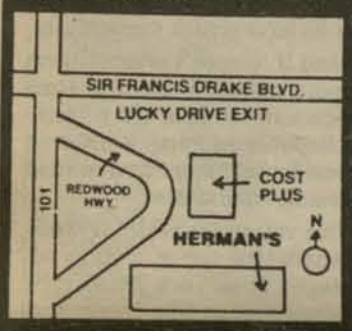

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Z-1

THIS WORLD, JULY 8, 1990

Intermediate markdowns may have been taken. Not responsible for typographical errors. Sale now through July 14.

BAKER

Continued From Page 2

surround Brunnhilde with a magic ring of animals on the endangered species list, thus scoring good-citizenship points by illustrating our need for these threatened creatures.

7. Speaking of endangered species, cut Siegfried's killing of the dragon. If you used a modern setting, you wouldn't have him kill a spotted owl, would you?

Yes, we realize the dragon has to be killed because he is sitting athwart the plot-essential gold, and that Siegfried has to kill the guard to get the gold, but you don't need a dragon for this job. Have an Episcopalian guard it.

8. Eliminate the offensive sexism occurring after Siegfried and Brunnhilde are married. After sleeping 20 years on a rock surrounded by fire, Brunnhilde would naturally want to go to law school or become a CEO, wouldn't she?

Instead, you have her start housekeeping in a cave after sending Siegfried out to enjoy an exciting career as a sort of professional hero.

Cut the happy-little-cavemaker treatment of Brunnhilde and have her accompany Siegfried. She is smart enough to stop him from idiotically drinking every evil potion anybody offers him, so you can have a happy ending.

9. Change villainous Hagen's name to something that sounds more Episcopalian. ■

New York Times

The Year of Women in Politics?

Bonnie Erbe and Linda Chavez
TURNABOUT

This year, 10 women are running for governor, eight for U.S. senator, and a record 65 for the House of Representatives. More than half of all voters in 1988 — 52 percent — were women. Is 1990 the year of women in politics?

Linda Chavez

Since the 1984 presidential election, the media and feminists have tried to convince the public the "gender gap" is a significant political issue. Women vote differently from men, they say, and the surest way to attract women voters is to put a woman on the ballot. What sexist bunk.

Women vote on the basis of their beliefs. I know — I speak from experience. I ran for the U.S. Senate from Maryland in 1986 and was solidly trounced by a woman, Barbara Mikulski. I lost because I was a conservative Republican in a state with less than 30 percent registered Republicans.

In the recent California gubernatorial primary, Dianne Feinstein beat her male opponent, Attorney General John Van de Kamp. But she lost the votes of women who considered Van de Kamp the more liberal candidate. While Feinstein's tough endorsement of the death penalty cost her some female votes, she made up for it among men who favor capital punishment.

Molly Yard, president of the National Organization for Women, has repeatedly said that NOW's ultimate political goal is to elect more women, regardless of party, because they vote "more reliably" on issues important to women such as child care. But party affiliation does matter, and feminist organizations overwhelmingly endorse Democrats.

The only two Republican women the National Women's Political Caucus is supporting in gubernatorial races this year are pro-choice candidates running against pro-life males, and one is running in a Republican primary.

So much for gender solidarity. What feminists really mean when they say they want more women in office is that they want more liberals. Feminists always support the liberal candidate, man or woman. Feminists want 1990 to become the year of the liberal, not the year of the woman.

Erbe: You claim women vote based on their beliefs and not on gender. But their gender shapes their beliefs.

Bonnie Erbe

Wait a minute there. Tear down what little recent progress women have made in politics to score a philosophical point or two? I don't buy that "feminists," whoever they are, and "the media," whatever they are, share some fanatical scheme to elect more liberals.

I hope 1990 is remembered as the year of women in politics, but that's not because I'd like to see more liberals elected. I hope this is the year women shed the handicaps that have plagued them since Jeannette Rankin became the first woman in Congress almost 80 years ago.

True, there are differences between the way men and women vote. It can be said women support a candidate based on the person's agenda. But the reason women are generally less hawkish, more likely to oppose the death penalty and favor gun control is that women are the kinder, gentler sex.

It's semantic gobbledygook to claim women vote based on their beliefs and not on gender. Their gender shapes their beliefs.

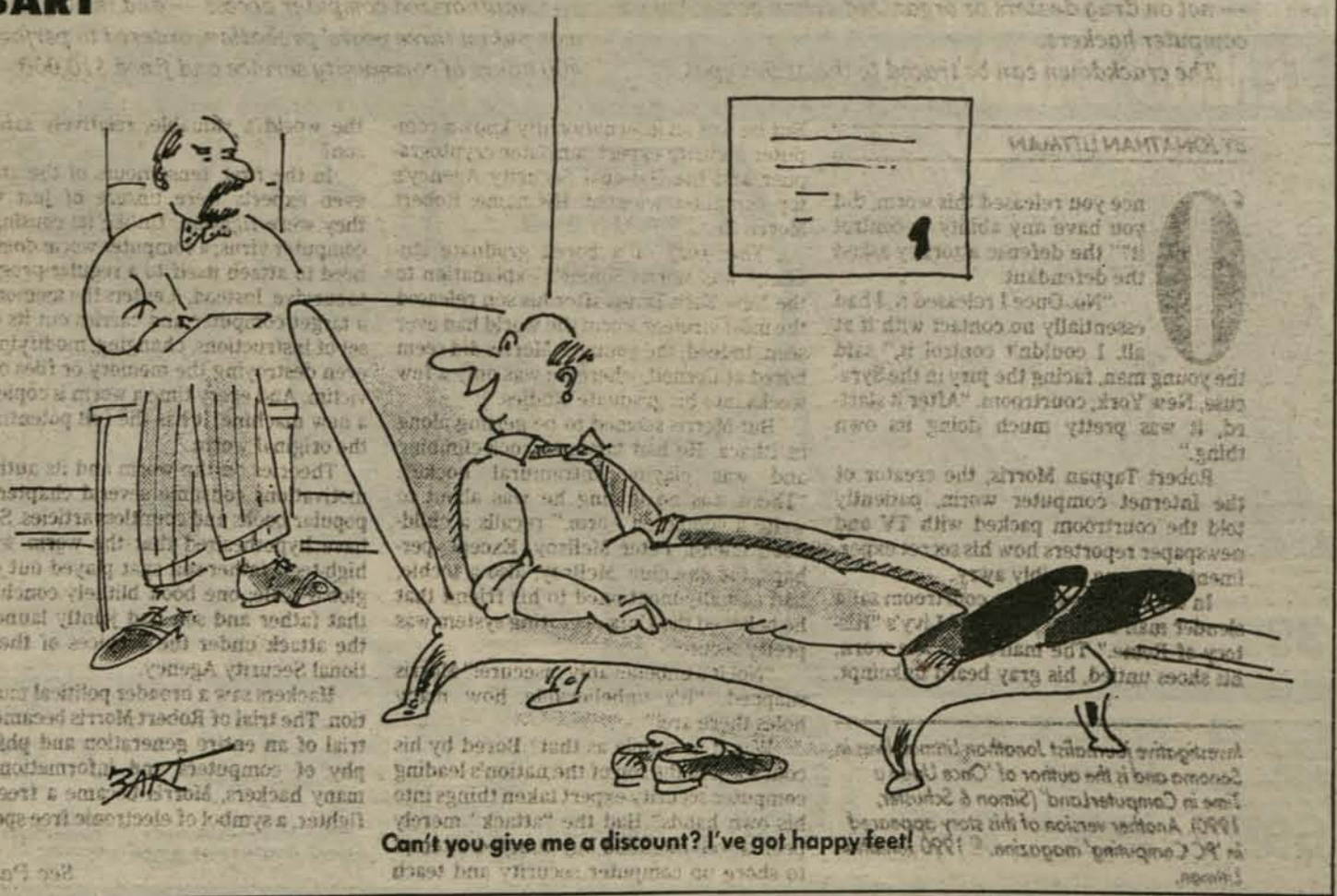
Women candidates still face tremendous obstacles, as my colleague understands better than most. Women must work harder for every dollar they raise for campaigns. And women must prove they are as "tough" as men, without being branded "aggressive" or "abrasive." It's a delicate balance and one that all too few women have struck successfully.

And if women's organizations support more Democratic than Republican women, it's because the Republican Party is offering a considerably more barren field of female candidates.

But voters are realizing women candidates offer certain advantages. New York Democratic Congresswoman Nita Lowey says polls suggest women are regarded as more honest, more sincere and more caring than men. So let's hail 1990 as a year of accomplishment for women in politics, instead of tearing it down. ■

Bonnie Erbe has been a researcher and reporter for television and radio networks and is now legal correspondent for the Mutual/NBC Radio Network. Linda Chavez is an editor and columnist and a political commentator for Canadian Broadcasting Corporation and National Public Radio. She was Director of Public Liaison and staff director for the U.S. Commission on Civil Rights for the Reagan administration.

BART



Can't you give me a discount? I've got happy feet!

BUSINESS

Continued From Page 4

public places.

We asked how he'd arrived at the assertion that Americans spend 20 minutes daily searching for misplaced objects. "Just think of how much time you spend looking for a can opener, for example," he said cheerfully. But, we asked, don't most people keep their can opener in a kitchen drawer, as we do? "But that time you spend fiddling around in the drawer looking for it is wasted time. . . . It's misplaced within the drawer. Those are the sort of minute measurements we had to do in our time-and-motion studies."

And what sort of measurements were behind the two hours and 20 minutes in the bathroom? "A lot of people just think of defecation," he said. "You've got to brush your teeth, floss, do your hair and wash up. You probably shower," he added, "but many other people take baths."

We wondered if there was good money to be made in this kind of consulting. "Our speeches book out at about $5,000 for a one-hour talk," he said. "But I'm not in this for the money or the publicity." ■

THE SHOCKWAVE RIDER

WHAT MADE ROBERT TAPPAN MORRIS UNLEASH A 'WORM' THAT PARALYZED COMPUTER SYSTEMS ACROSS THE COUNTRY?

This summer, federal law-enforcement agents from Los Angeles to New York have enlisted the Secret Service, the U.S. Department of Justice, the FBI and state and local authorities in a nationwide crackdown — not on drug dealers or organized crime bosses but on computer hackers.

The crackdown can be traced to the archetypal hacker, 25-year-old Robert Tappan Morris, who created a computer worm that paralyzed thousands of computers around the country in early November of 1988. He was indicted and convicted of felony trespass — unauthorized computer access — and in May, Morris was put on three years' probation, ordered to perform 400 hours of community service and fined $10,000.

BY JONATHAN LITTMAN

"Once you released this worm, did you have any ability to control it?" the defense attorney asked the defendant.

"No. Once I released it, I had essentially no contact with it at all. I couldn't control it," said the young man, facing the jury in the Syracuse, New York, courtroom. "After it started, it was pretty much doing its own thing."

Robert Tappan Morris, the creator of the Internet computer worm, patiently told the courtroom packed with TV and newspaper reporters how his secret experiment had gone terribly awry.

In the front row of the courtroom sat a slender man holding a copy of Livy's "History of Rome." The man's suit was worn, his shoes untied, his gray beard unkempt. But he was an internationally known computer security expert, a master cryptographer and the National Security Agency's top computer scientist. His name: Robert Morris Sr.

"The work of a bored graduate student," was Morris Senior's explanation to the New York Times after his son released the most virulent worm the world had ever seen. Indeed, the younger Morris did seem bored at Cornell, where he was only a few weeks into his graduate studies.

But Morris seemed to be getting along in Ithaca. He had taken to rock-climbing and was playing intramural hockey. "There was no inkling he was about to write a computer worm," recalls a childhood friend, Peter McIlroy. Except, perhaps, for one clue. McIlroy, also a techie, had casually mentioned to his friend that he believed the Unix operating system was pretty secure.

"No! It's unbelievably insecure!" Morris snapped. "It's unbelievable how many holes there are!"

Was it as simple as that? Bored by his courses, had the son of the nation's leading computer security expert taken things into his own hands? Had the "attack" merely been a well-intended but bungled attempt to shore up computer security and teach the world a valuable, relatively safe lesson?

In the first, tense hours of the attack, even experts were unsure of just what they were fighting. Unlike its cousin, the computer virus, a computer worm does not need to attach itself to a regular program to survive. Instead, it enters the memory of a target computer and carries out its own set of instructions, changing, modifying or even destroying the memory or files of its victim. And every time a worm is copied to a new machine, it has the full potential of the original worm.

Theories on the worm and its author's motivations consume several chapters of popular books and countless articles. Some have hypothesized that the worm was a high-tech father-son spat played out on a global scale; one book blithely concluded that father and son had jointly launched the attack under the auspices of the National Security Agency.

Hackers saw a broader political motivation. The trial of Robert Morris became the trial of an entire generation and philosophy of computers and information. To many hackers, Morris became a freedom fighter, a symbol of electronic free speech.

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Investigative journalist Jonathan Littman lives in Sonoma and is the author of 'Once Upon a Time in ComputerLand' (Simon & Schuster, 1990). Another version of this story appeared in 'PC Computing' magazine.

SHOCKWAVE

Continued From Page 7

a voice against the power that centralized computers wield over individuals.

But more than a few hackers wondered if the coup was misguided, if Morris was not placing at risk the very freedom of information that his supporters angrily demanded.

The story of Robert Tappan Morris begins with his father and the hauntingly powerful electronic world he helped to create. In the early 1970s, when Bell Laboratories began designing the universal operating system called Unix, it was Morris Senior who imbued the virgin software with security.

"The scheme for encrypting passwords was very heavily influenced by him, the interest in low-grade cryptography — the things we think of as absolutely routine," says Douglas McIlroy, Peter's father and one of the designers of Unix at Bell Labs' Murray Hill, New Jersey, facility. The elder Morris helped bar snoopers by making it difficult for anyone to become a "super user" — a person with the power to use or abuse a system.

"There was this constant game of trying to figure out how to circumvent the best security measures we had," McIlroy recalls. "You had to be able to out-think the most devious minds."

That was the dilemma Morris Senior faced: to protect, he had to know how to destroy.

First Bell and then other companies invited Morris to break into their computer centers to test their defenses. Hired by one defense contractor to discover its computer system's Achilles' heel, Morris dressed himself as a security guard, walked in, and watched someone type a password. While this tactic was an exception (Morris usually broke systems with his encyclopedic knowledge of encryption, cryptography and computer security), it demonstrated his dramatic side. "Bob had a certain amount of flair," recalls McIlroy. "He definitely enjoyed his prowess."

By the 1980s, the chain-smoking, shabbily dressed scientist had developed into a master cryptographer and a world expert in protecting electronic information. He designed a Navy computer that tracked enemy submarines by spotting anomalies in the masses of data gleaned by ocean sensors. At the time it was the world's largest computer.

Morris Senior's stage broadened in 1986, when he became the chief scientist at the National Computer Security Center of the National Security Agency and assumed responsibility for protecting sensitive computer-based data worldwide.

Years later, in the tumultuous days following his son's Internet attack, Morris Senior's sense of mystery and drama had not waned. Newspaper and TV reporters camped in front of his new home in Arnold, Maryland. Inside, Morris Junior was quiet, talking little even to his Harvard buddies who had driven through the night to support their friend.

It was his father who spoke to the press, telling the New York Times, "I know a few dozen people in the country who could have (created the worm). I could have done it, but I'm a darned good programmer." Perhaps it was not surprising that after the press left, Morris Senior placed the puzzling deed in historical focus. "Let's find out where all this started," he said to his son's friends, pulling down a book by John Brunner titled "The Shockwave Rider."

In a scholarly tone, Morris Senior explained that the 1976 science fiction classic, one of his son's favorites, popularized the idea of computer worms. What he didn't explain was that the book's protagonist was remarkably similar to himself. And to his son.

Like both Morrises, the Shockwave Rider outsmarted computer security measures with the cunning of a secret agent and, like Robert Morris Jr., the Shockwave Rider was forced by his genius to make a difficult, controversial decision. Having spent his youth expanding his computer powers, the Shockwave Rider pondered the true test of wisdom:

"What a wise man can do, that can't be done by someone who's merely clever, is make a right judgment in an unprecedented situation."

Morris Junior began reading at the age of 4. The curious toddler created working scale models out of paper, file folders and paper clips — cars with wheels that turned when you moved the steering wheel and revolvers with bullets and chambers that turned. At 9, he read stacks of Scientific American.

ILLUSTRATIONS BY LOURDES LIVINGSTON/THE CHRONICLE

Young Morris may have been charged with the crime of the future, but he grew up in a world closer to the last century than the next. The Morris family lived in a 250-year-old farmhouse on nine rambling acres of spruce, pine and swamp alongside the Passaic River near the quaint town of Millington, New Jersey. The three children cared for the farm animals and Robert, the eldest son, tended the family's sheep.

There was something untamed about the Morris clan. "I don't think the Morrises even knew how many cats they had," recalls a friend, who says 20 or more cats roamed the property while three or four big furry black dogs ruled the hearth.

Almost everything at the Morris house had a story behind it, no matter how obscure it might appear. The house was overflowing with puzzle sculpture pieces, magazines and more books than you'd find in most small libraries. And not just any books. Morris Senior had been a brilliant mathematician at Harvard, but he also loved the classics and learned to read Greek and Latin. His wife, Anne Morris, counted the vast family collection one day and, after tossing out duplicates, logged 7,000 volumes.

Morris Junior began reading at the age of 4. The curious toddler created working scale models out of paper, file folders and paper clips — cars with wheels that turned when you moved the steering wheel and revolvers with bullets and chambers that turned. At 9, he read stacks of *Scientific American*. His father had a ham radio license, and before long the boy began assembling and disassembling radios and a variety of other electronic equipment.

But downstairs, in the old kitchen in front of an unused Dutch oven, was a machine like no other. From a distance, it looked like a huge mechanical typewriter stretched over a desk, but what were those protruding rods and cables? The strange-looking device, which had been in the house since the mid-1960s, when Morris Junior was born, was a computer terminal.

As a top scientist at Bell Labs, Morris Senior was one of a few employees with a home computer terminal during an era when electric typewriters were still rare.

Robert was captivated by the clanking, screenless terminal. Each time he struck a key on the machine, mechanical rods shifted like the trackers of a pipe organ, forming the eight bits that made their way over the terminal's modem to Bell's central computer. Frequent lubrication was needed to keep the machine's rods from sticking, and after a long session, Robert would often emerge with oily knees.

When Peter McIlroy visited the Morris farmhouse, he noticed his friend wasn't merely playing the computer's math and guessing games. "By the sixth grade, he was finding holes (in the operating system)," recalls McIlroy. "But he wasn't a snoop. It was much more of an intellectual game."

Not yet in his teens, Morris Junior already knew his way around the huge, complex Unix operating system. He created multiuser games to chat with his friends simultaneously and a surprisingly sophisticated Unix interface shell. The Unix code was on line — stored on the system — and nearly every day after school Robert studied it the way other boys studied girls. His girlfriend, the daughter of another Bell employee, was on line, and the budding hacker zapped love notes to her.

By his mid-teens, the young Morris showed Peter McIlroy how, by logging on to one terminal, he could masquerade as a legitimate user on any computer in Bell's network. "He found it, played with it, and fixed it," says McIlroy. "I think they (Bell officials) were impressed." Bell officials say that while Morris did modify some files, no serious damage was done. "He was told to stop and that was that," says Bell's Fred Grampp.

But Morris was allowed to visit his father's office and continue his poking, and in December 1982, Grampp invited him to give a talk about tightening up security on a Unix communications program. Soon Morris was working part time at the lab after school and full time for the next two summers, writing his first scientific paper, "A Security Flaw in Berkeley . . . Unix," in January 1983.

His initiation into the rites of superhacking couldn't have been more pure. In the elite, challenging research environment of Bell Labs, the teenager learned to spot and repair security holes at the feet of the very people who had created Unix.

Years later, his parents proudly announced that it was he who was featured in a 1982 *Smithsonian* magazine article as a "quiet, polite young man" who "had broken into password files" and read "supposedly private" computer mail. "I never told myself that there was nothing wrong with what I was doing," the boy was quoted as saying, adding that he was driven by the challenge of testing computer security. It was a family preoccupation that Morris shared with his fictional double, the Shockwave Rider:

"I guess my daddy was a 'phone freak' and I inherited the gene."

The next year Morris Senior and Grampp wrote, and, with some trepidation, published the definitive paper on Unix security. In the footnotes was a reference to Morris Junior's paper, and in the introduction, a warning: "There is a fine line between helping administrators protect their systems and providing a cookbook for bad guys."

"Aren't you this famous, great hacker?" asked an impressionable fellow Harvard student. "No," said Morris, his boyish face betraying embarrassment and a slight smile. "That's my roommate."

Morris continued the playful deception for several minutes. The Shockwave Rider, too, had many identities, many lives woven through the electronic net:

"An individual could rewrite him or herself via any terminal connected to the federal data banks . . . this was the most precious of all freedoms . . . freedom to become the person you chose to be instead of the person remembered by the computers . . . it was the enchanted sword, the invulnerable shield, the winged boots, the cloak of invisibility. It was the ultimate defense."

Morris had several identities at Harvard. The story goes that as a freshman he walked in, brought down the system, and hacked his first identity, an unauthorized Harvard account. Whether that initial act of mastery is myth or fact, in a matter of months Morris had hacked and cultivated a fistful of computer credit accounts. His log-on name became his identity, both on line and among his friends: RTM.

As a freshman, RTM began hanging around Harvard's graduate computer science department, Aiken Lab, an ugly slab of concrete built in the '40s and named

after one of the inventors of the modern computer. It was here, behind a glass wall, opposite the antiquated vacuum-tube computer, that RTM spent most of his waking hours.

"He'd fix things for free," recalls Paul Graham, a computer science graduate student and close friend. "There was no question that he was the most technical person."

RTM's breadth of knowledge was exceptional: Unix, several other computer languages, networking, hardware and graphics. Andrew Sudduth, Aiken's system manager, hired RTM, and like many who employed him on campus, Sudduth found that RTM was too busy chasing the latest computer problem to punch a time clock or do his class work. "A professor would say, 'Wouldn't it be nice if we had this?' " he recalls. "And Robert would go and do it."

He began by pacing the halls. There was no evidence he was working on the problem. After sufficient gestation, he settled in at a terminal, preferably "a lousy one" with a black-and-white display — a throwback, says Graham, to his days on his father's mechanical, screenless terminal. There were no distractions, no interruptions, and once he began, the pace was fierce, for RTM could program as fast as he could type.

Rail-thin, RTM ate little, and when classmates invited him to lunch, two hours later he would still be hunched over his keyboard, typing furiously. Friends would stand over him, calling out his name, but the transfixed programmer seemed to hear nothing. When a few nights of intense programming finally jelled, RTM would snap out of his spell. "He would jump up and rub his hands when he figured something out," says Sudduth.

Not all of his achievements were altruistic. RTM could do "anything he wanted" when friends were logged on to a Sun workstation, according to Graham and others. One of his most playful pranks was creating a subliminal message that would flash for less than half a second on the screen of an unsuspecting user. Graham said he saw the fleeting message, "Help, I'm being held prisoner within a VAX 750!" and then wondered if he'd imagined it.

Occasionally RTM took the game further, demanding a response to his whimsical intrusions. Classmates sometimes found their work interrupted by a sage called The Oracle. "Ask me a question and I will answer you," asked RTM, The Oracle. "But first you must answer me."

Some of his pranks tested a user's technical knowledge. On a lark, RTM reverse-engineered the Harvard network into an older, defunct interface. Everything worked, but the commands were different, and "true" hackers seemed to enjoy the challenge. Roommate Greg Kuperberg, a nationally ranked college mathematician (also prone to feverish pacing) who befriended RTM and collaborated with him on an elaborate graphics program, says his friend's forays into Harvard's computers were exaggerated and misunderstood. RTM was simply inquisitive, says Kuperberg, and his experiments were not much different from those of a young chemist who occasionally mixed the wrong chemicals.

But RTM's experiments were not without side effects, and there were some who didn't consider it good, clean fun. One night, Robert Ziff, a Harvard engineering student, watched the program he was working on slow to a snail's pace. He complained to the department's systems manager, who checked to see who was tying up the computer's resources and exclaimed, "Oh God! It's Robert Morris."

RTM had programs simultaneously running off his accounts on the engineering and robotics computers — in addition to Aiken's. It wasn't the first time he had "hogged" computer time.

Meanwhile, off campus, RTM was building professional credentials as a dedicated computer security expert.

"The Unix software is very flexible and convenient, but it places too much trust in a protocol that provides very little security," he warned in a 1985 Bell Labs paper that described how to attack "trusting" hosts on the vast national computer network known as Internet.

Two years later, while still at Harvard, RTM delivered several long talks on his extensive knowledge of computer security at the National Computer Science Security Center and the Naval Research Lab. During his summers he hacked for computer companies on both coasts.

Rail-thin, RTM ate little, and when classmates invited him to lunch, two hours later he would still be hunched over his keyboard, typing furiously. Friends would stand over him, calling out his name, but the transfixed programmer seemed to hear nothing.

As he became more technically accomplished, his two personas — the mischievous RTM and the dedicated computer security expert, Robert Morris Jr. — struck an uneasy balance. The same friends who detail how RTM inspired fear in his enemies remember him as a person who believed in the importance of "character" and who hacked out favors at a moment's notice.

But in his professional role, Morris increasingly found that the real world was not nearly as responsive to security concerns as the Bell Laboratories of his childhood. He discovered that if he reported a security bug, companies often did nothing, or they waited for months before issuing patches, or fixing the bug. He worried that unscrupulous hackers would take advantage of his discoveries. He began to keep the secret openings to himself.

When RTM was taking graduate mathematics and computer science courses in 1985, the combination of his free-lance projects, his generosity and the difficulty and the boredom of graduate work became too much for him. RTM did not excel in every course, as his father had. So he dropped out and went to work at the Convex Computer Corporation, in Richardson, Texas.

The young hacker's education began to have more in common with that of the Shockwave Rider:

"Shortly thereafter, he began to concentrate on data processing techniques at the expense of his other study subjects."

The following year, Morris Junior returned to his Harvard studies eager to learn. Friends remember his pacing about their homes or apartments, picking up things to see how they worked. Often his excitement bubbled over. "He was always breaking things," says Graham. "And he was insatiably curious."

The love of the classics his father had inspired had not diminished. "He might be interested in medieval art, English history (a poster of English kings adorned his dorm room), Homer, the Renaissance, or Greek art," recalls a Harvard classics professor RTM helped with some computing problems. "His knowledge was pretty encyclopedic." But the serious topics didn't keep the Harvard student from classic adventure stories like the Norse sagas and one of his favorites, "The Three Musketeers."

Something of an adventurer himself, RTM and a classmate spent a week buying copies of The Racing Form at 6 a.m. and entering "tons of data about correlations of past performances." Then the budding computer bookies took in their first horse race at nearby Suffolk Downs. "It was so depressing," says RTM's friend about the crowd of retired, alcoholic pensioners. Deciding it "criminal" to beat such sorry bettors, the two abandoned their get-rich-quick scheme.

Computer graphics became a new infatuation. With Kuperberg, RTM created an advanced ray-tracing graphics program. When he found that higher mathematics was not enough to create beautiful forms, he turned to the ancients, studying the works of Vitruvius, the inventor of proportion standards for classical columns. One of RTM's finest creations was of a temple standing in the middle of a blue sea.

Excited by their success, the talented duo entertained the idea of launching a computer graphics firm. "We had this picture of a kid running a lemonade stand who one day turned into Donald Trump," says Kuperberg, who, like his friend, had a "default plan" of graduate school.

Back and forth, back and forth. It was the way RTM entertained an idea, as if by the movement of his light steps he might nudge the completed thought from his brain. But this time he seemed more driven than usual.

RTM had driven the nearly 300 miles from his graduate computer science studies at Cornell to pore over the Unix source code at Harvard's Aiken Lab and visit his friend, Paul Graham. "He had discovered a big hole and he had to tell someone," recalls Graham. Excitedly, RTM paced the small office, telling Graham how he had isolated holes in Unix that could enable him to be a super user — not at Cornell or Harvard, but across the country and around the world. Both of the bugs were communication holes, but RTM explained how the FTP (File Transfer Protocol) bug could conceivably grant an invader root privileges — the ability to read or delete anything on a compromised machine.

"It was an experiment," Morris later testified. "I had never heard of anything like it before ... to see if I could write a program that would spread as widely as possible in Internet." His friend was similarly entranced. "I thought it was the greatest idea," says Graham. "All over the world. A big living organism. No one had ever done it before."

Of course, it had been done before by the Shockwave Rider:

"This is indeed the father and mother of a tapeworm. You'll have noticed how much use it makes of terminology derived from the study of living animals. And with reason. Not for nothing is a tapeworm called a tapeworm. It can be made to breed ... my newest — my masterpiece — breeds by itself."

To Graham, the worm was not only an incredible creation, it was a bold strike for freedom, and later in court he would compare RTM to Mathias Rust, the West German pilot who landed in Moscow's Red Square in May 1987. Encouraged by his starry-eyed friend, RTM paced, describing how he wanted every computer on the Internet to receive one innocuous probe, one worm that would wriggle its way into each computer's memory.

Graham suggested that the worm write something to the computers it wriggled its way into.

"No, no, we can't do writes," his friend said, explaining that any writes, no matter how well intended, might be dangerous.

What the two couldn't figure out was how to protect a single worm on each machine. "It would have been very simple for someone to write a program that just acted as if it was a worm," Morris testified, tricking new worms into believing a computer had already been penetrated and stopping his worm from growing at all. And so, he decided it might be all right to have two, or maybe three, worms per machine.

But neither knew much about population growth, and if RTM had any technical shortcoming it was his ambivalence toward higher mathematics. There on the sidewalk, the two decided that the second worm to invade a machine should have a one-in-seven rate of survival.

No particular formula was used, Morris later told a jury. "It was based on the

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SHOCKWAVE

Continued From Page 9

intuition I had on how rapidly it would spread." He figured a new worm might appear once every few hours. As the Shockwave Rider explained, everything was under control:

"And no, it can't be killed. It's indefinitely self-perpetuating so long as the net exists . . . incidentally, though, it won't expand to indefinite size and clog the net for other use. It has built-in limits."

RTM had been busy. More than a week before his visit to Harvard, he had created a wish list for his worm on his university computer. It was strangely appropriate that he began the work at Cornell. Officials would later say it was his reputation as a hacker that gained him admittance to the university's prestigious graduate school in computer science.

RTM's list was divided into the two main goals he had for his worm: attack and defense. The target was Internet, an umbrella of three national communication networks, including ARPAnet, run by the Department of Defense to link research computers at military sites and universities; MILnet, used by military and civilian researchers to send routine, unclassified communications; and NSFnet, a National Science Foundation network.

In the beginning, RTM and Graham used the popular term "virus" to describe the worm, but as the creation took shape it came to resemble the prehistoric worm. Viruses exist by invading and altering their host cells, and their computer counterparts are similar. They cannot "live" or run without attaching themselves to other programs. But a computer worm is independent. Self-propagating and self-running, worms can exist without directly endangering a network or its users. Some early computer worms were actually loosed to perform network management tasks. The Shockwave Rider's worm had a higher social and moral goal:

"The privacy my worm is designed to invade is that privacy under whose cover justice is not done and injustice is not seen."

RTM designed his worm to clone itself, spreading throughout the net. Searching out new nesting locations, the worm scanned address lists of computers, selecting the most directly linked machines, and then began cycling through its attacks. If one method failed, the tireless invader quickly picked another from its arsenal. The attacks fell into three categories: hooking a foothold through a security hole, taking advantage of "trusting" computers, and cracking passwords. RTM playfully named his worm's attack engine the "cracksome" routine.

Footholds could be gained through either of two techniques. One involved a utility designed to elicit such information as a user's full name, office, and phone number. It was fittingly named Fingerd. The worm overflowed the program's small buffer and tricked unsuspecting machines into downloading, compiling and running a "grappling hook" — the worm's scout.

Once ensconced within the target computer, the hook called the original worm and "pulled" back sections of a new version of the original worm. Finally, the hook linked the sections together and the new worm began running.

A similar attack was launched on an electronic mail program called Sendmail.

BY MARTY KATZ/SPECIAL TO THE CHRONICLE

Anne Morris

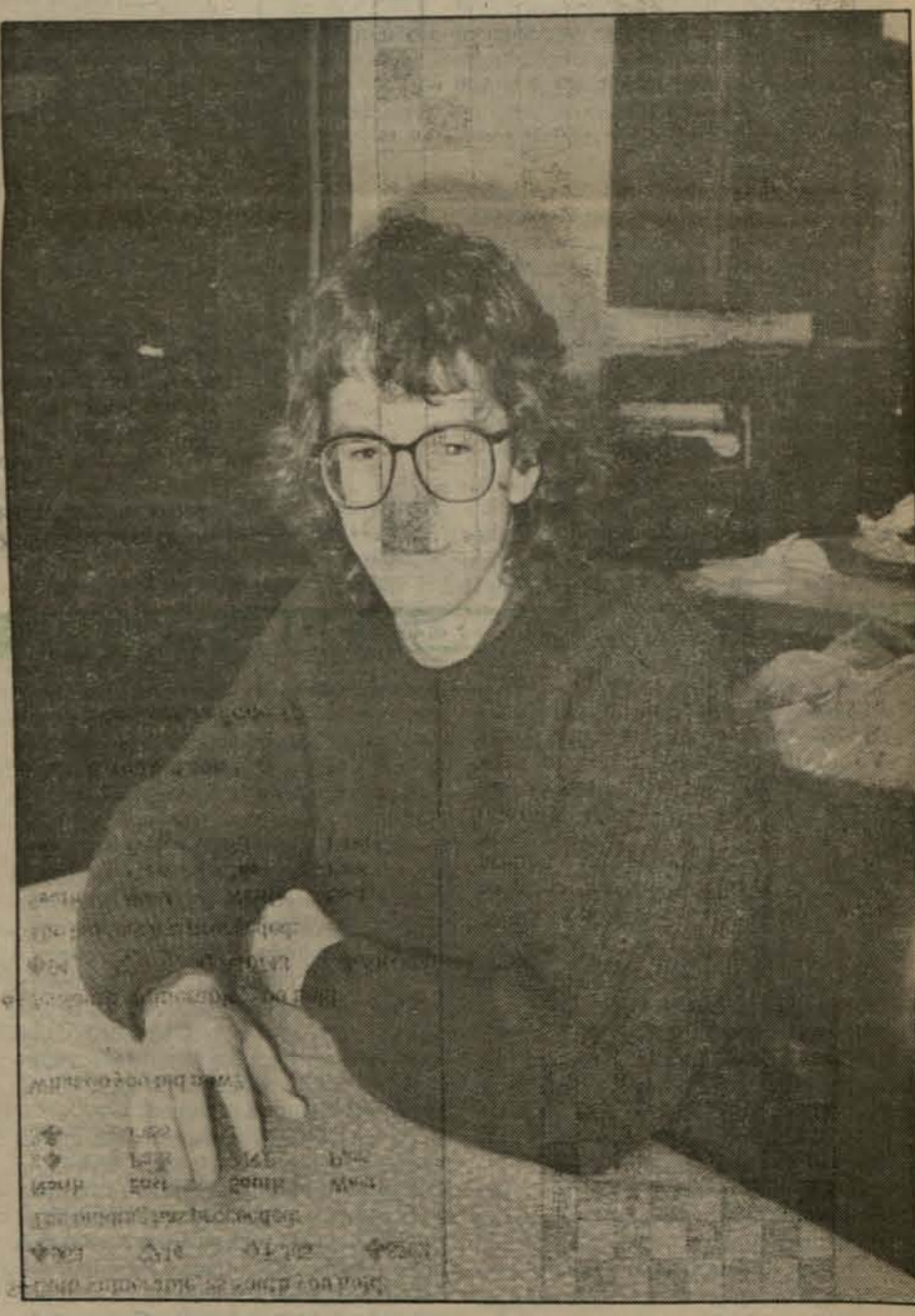
RTM had discovered that the program's seldom-used debugging utility allowed users to send a set of commands instead of a user's address. Through this gaping security hole went the worm's grappling hook, and, as in the Fingerd attack, in less than a minute, a new, fully functioning copy of the worm was running on the target machine.

The worm made another attack, not so much on a security hole as on the network's community of trust. Once a machine was invaded, the worm attempted to connect with remote machines that "trusted" the invaded machine and didn't require a password. The techniques were similar to what RTM had described as a teenager in a Bell Labs paper on a "weakness" in security that allows "users on untrusted and possibly very distant hosts to masquerade as users on trusted hosts."

These were the cracked windows, loose hinges, and open doors upon which the worm directed its principal attacks. But the worm also tried to find keys lying around, checking to see if an account had no password, and then attempting simple heuristics using a combination of words from a user's account, including names, nicknames and names spelled backwards.

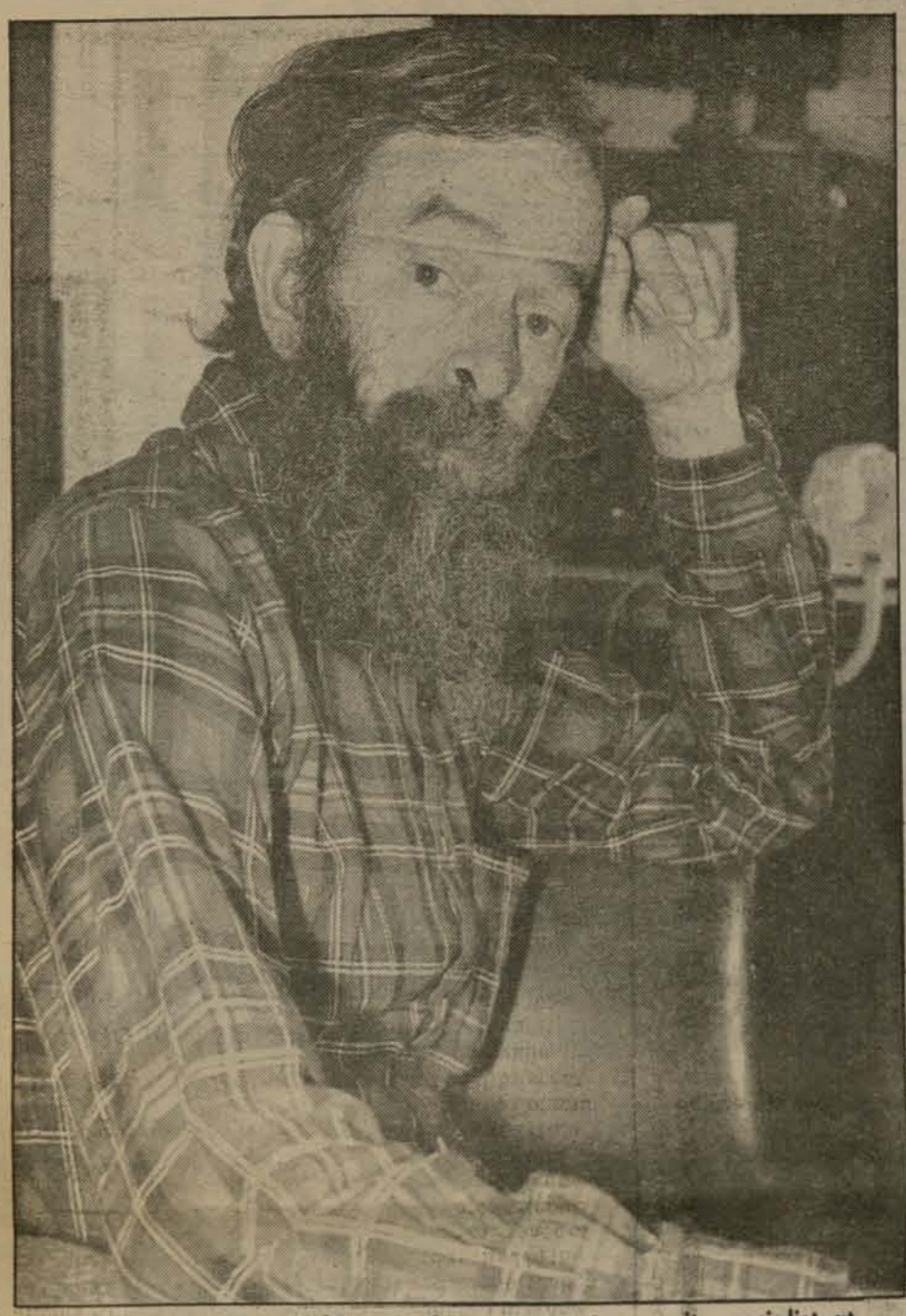
If these attacks failed, the worm would try its internal dictionary of 432 passwords. But the task of cracking new passwords was a time-consuming process. The only passwords publicly available were encrypted. To figure out the true password behind its encrypted double, the worm had to encrypt its own internal list of probable passwords against those it attempted to crack. After trying this strategy for a few seconds, the worm tried words from Unix's on-line dictionary, using the same tedious encryption method.

Cycling through its arsenal of attacks, the worm continually camouflaged and transformed itself. Immediately upon arriving in a new computer, the worm deleted the disk copy of itself and ran only in memory under the alias of an innocuous command interpreter, the kind often used in shell scripts or automatic commands.



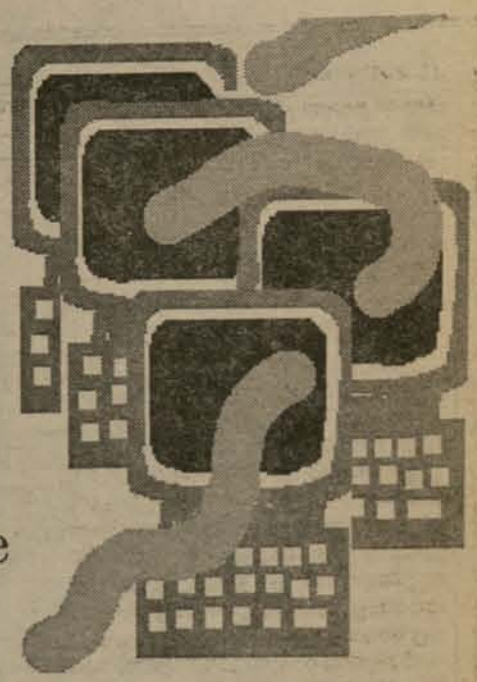
BY MARTY KATZ/SPECIAL TO THE CHRONICLE

Robert Tappan Morris Jr., at his parents' home in Maryland



BY MARTY KATZ/SPECIAL TO THE CHRONICLE

Robert Morris Sr., a National Security Agency computer security specialist, at home in Arnold, Maryland



On Internet, the worm was awakening. One hour and 24 minutes after the release, the worm squirmed its way across the country and into the computers of the Rand Corporation in Santa Monica. In two hours it hit the major gateway at the University of California, Berkeley, the Lawrence Laboratories in Berkeley and Livermore, and the Los Alamos National Laboratory in New Mexico.

Every three minutes, the worm forked, splitting into a dead parent and child. The child started off "fresh," using no apparent resources such as processing time or memory usage. The short dashes made the worm more difficult to seize, even if it happened to be spotted.

The worm left few clues. It read all its support files into memory, deleting file system copies that might be noticed. And by turning off the generation of core files, if the worm made a mistake and accidentally died, it left no corpse behind. Once every 15 infections, the worm attempted to connect to a Berkeley computer. RTM had hoped this "red herring," as he called it, might by itself shift suspicion onto the computer center, but it never actually made the connection.

Finally, if the worm, or parts of it, were somehow captured, the binary (near machine-level) program would require many hours of complex decompilation before its nuts and bolts could be understood.

For nearly three weeks RTM worked sporadically on the worm, increasing the number and complexity of its potential assaults. Its diverse collection of attack strategies made it more like a bulky battleship than a sleek submarine, and one friend and security expert later called it "everything but the kitchen sink."

RTM collected password files from computers at Stanford, Harvard, Berkeley and other universities around the country; he found the fast encryption routine he needed in a program written at Bell Labs; he incorporated password-breaking techniques his father had discussed in his classic paper on Unix security. RTM didn't want to omit anything, and he feverishly threw a decade of security training into the worm. There was little time to check for errors. Besides, The Shockwave Rider didn't make mistakes:

" 'How the hell were you able to build a tapeworm this complicated?' It's a talent, like a musician's or a poet's. I can play a computer read-in literally for hours at a time and never hit a wrong note."

Everything seemed to be going exactly as planned. On Wednesday, November 2, 1988, RTM logged on to his terminal at Cornell's Upson Hall at a little after 10 a.m. and worked until lunch. In the afternoon, the trouble began.

RTM noticed an electronic bulletin board message from Keith Bostic, of Berkeley: a patch for the File Transfer Protocol bug RTM had discovered on his fateful visit to Harvard. RTM quickly typed out an electronic mail message to Sudduth, asking whether he had been the source of the leak.

"I didn't think it was a good idea to spread information about random security holes," Morris later testified.

Sudduth sensed panic in his friend. "Maybe he worried that the (other) bugs would be patched before he sent his worm."

At 8 p.m. EST, sitting at his Upson Hall terminal, RTM copied the worm to an account at MIT known to be frequented by hackers. *"I wanted to start it out so it wouldn't be obvious that I had started the worm myself,"* Morris testified. (The final version of the worm did not include attacks on the now-patched FTP bug.) For the next 20 minutes RTM tried to track the worm's path, but as far as he could tell, "it wasn't working right. It seemed to have been getting bogged down, not really doing very much."

And so, having begun his experiment, RTM left his terminal and walked home.

On Internet, the worm was awakening. One hour and 24 minutes after the release, the worm squirmed its way across the country and into the computers of the Rand Corporation, the Santa Monica non-profit research center.

In two hours it hit the major gateway at the University of California, Berkeley, the Lawrence Berkeley Laboratory and the Lawrence Livermore Laboratory in Livermore, and the Los Alamos National Laboratory in New Mexico. Very quickly it became apparent that something had gone terribly wrong. Individual machines became infected by not one or two but several worms. Then the infection erupted.

Since university and military computers are rarely used so late at night, they generally register only a 1 or 2 load average of a possible 100. But by 9:21 p.m. PST, computers at the University of Utah had already documented a load of 5. Twenty minutes later, the load reached 7; in another 20 minutes, 16, and incredibly, in just another five minutes, the system topped out at 100, choking to a standstill.

Of course, as his lawyer later argued, RTM had been careful to ensure that his worm not read, delete or in any way damage targeted computers. But he hadn't counted on a more insidious risk. Simply by reproducing, the worm was sucking the oxygen out of Internet the way algae strangle a dying sea.

RTM's birth control wasn't working *quite the way he had planned. Only the first worm on a machine listened for others. Subsequent worms didn't hear each other and didn't submit to the killer one-in-seven dice roll. And those few worms that lost the roll were allowed to continue their efforts to propagate new copies of themselves on other machines, even after they'd received death sentences.*

Emergency teams at Berkeley, MIT and other computer centers worked frantically to stop the invader. Though the worm didn't appear to be directly damaging files, the rescue workers desperately searched for hidden trap doors, Trojan horses, or time bombs. By midnight EST, NASA's Ames Research Center, in Silicon Valley, had shut off all communications with outside researchers, stranding 52,000 computer users. Minutes earlier, one of the Berkeley scientists on the front line had sent out an electronic SOS over the net. "We are under attack from an Internet virus . . ."

"No. We can't stop it! There's never been a worm with that tough a head or that long a tail. It's building itself, don't you understand? Already it's passed a billion bits and it's still growing . . . and now it's so goddam comprehensive that it can't be killed. Not short of demolishing the net!"

While computer experts across the country raced to salvage what they could of the worm's wreckage, RTM sat dazed. When he telephoned Sudduth, his voice was deathly quiet. Sudduth passed the receiver to Graham, who listened to the barely audible voice and wondered whether Morris had broken up with his girlfriend.

"I really f - - - ed up," said Morris as he quietly described how his worm was repro-

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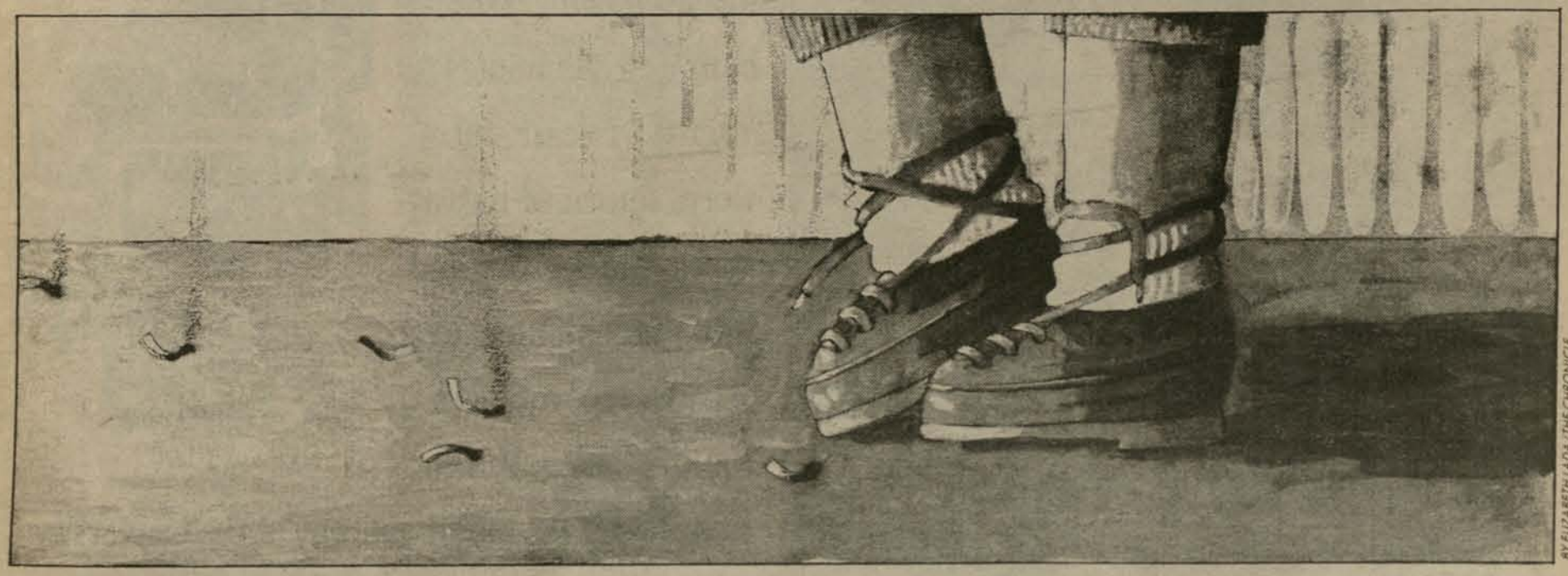

BY ELIZABETH LADA / THE CHRONICLE

We had started playing with matches, progressing from burning gum wrappers to milk cartons. Bored with small-time fires, we decided to go all the way now that we had Rick's magic to save us.

THE MAGIC TRICKS

BY GARY SOTO

My brother pulled a penny from his ear when he was 6. I was 5 and learning to tie my shoes because my mother said it was now or never, seeing that I was finished with an unruly year of kindergarten, where I managed to learn the primary colors but little else. She was tired of me getting my shoelaces caught in the spokes of my tricycle, tired of having to wipe her hands on her apron and trudge down the steps to set me free.

Rick said, "Watch this," and a bottle cap that I recognized from my collection then appeared from his nose. I touched his nose softly, amazed that my brother could do something other than beat me up. When he coughed and a dry apricot rested in his palm, I looked into his mouth. When he scratched his hair and a twig fell out, I smoothed his hair.

"How'd you do that?" I asked. I coughed a dry cough three times but only the sour smell of just-eaten pickles issued from my mouth. I scratched my hair, and an oily film waxed my fingertips.

"Magic," he said and turned away. I followed him as he walked up the alley, begging to know, my shoelaces dragging in the dust, the tongues of my tennis shoes lapping up foxtails and sticker plants.

"Come on, Rick," I begged. "Just teach me the bottle cap one." He told me to go away, that he and Arnold, a neighbor kid whose arm was palsied from traveling through the washing machine wringer, were going to practice dangerous animal magic. He didn't want me to see. He said it was magic that sometimes leaped back on people, turning them into cats or dogs.

"You're lying," I snickered. I was getting used to my brother tricking me, saying things like, "Captain Kangaroo lives cross the street from us"; "Annette Funicello is a fifth-grader at our school"; and "You can die three times before you're really dead."

I returned home to sit in the shade of the back porch with my sister. I practiced loop, bow, tug, but the laces, black from dragging in the dirt, kept getting knotted until they looked like my kindergarten scribbling. My sister Debra, with small fingernail-polished hands, helped me untangle them and wrap the long laces around my naked ankles. I walked around the yard thinking that maybe this was another way of tying shoelaces and perhaps Mother would be satisfied when she came home from work. I had two days to learn or she was going to take away my shoes.

I was feeling good about learning to tie my shoelaces when Rick came back into the yard. He looked at us strangely, his eyes bugged out so the white showed. He said, "A car ran over me and used up one of my lives. I have two more."

"Rick, why don't you cough and show Debra the apricot pit," I asked. "And you didn't die."

"I did."

"You didn't," I argued, remembering that the man across the street from us was a plumber, not Captain Kangaroo, and Annette Funicello was just a picture cut from a magazine and tacked on the fifth-grade bulletin board.

Rick coughed and a rubber ball rolled from his mouth, the kind used in a game of jacks. He sneezed, and a jack fell from his nose. He rubbed his eyes with his fists, and two marbles gleamed at us.

I turned to Debra. "Magic."

Rick quivered his outstretched fingers at my shoelaces and said, "I predict they'll come untied." I took a few steps and, sure enough, they tumbled from my ankles.

I was proud that my brother knew magic, and trusted him when he said, "Go ahead and burn the house down."

We had started playing with matches, progressing slowly from burning gum wrappers to milk cartons. Bored with these small-time fires, we decided to go all the way now that we had Rick's magic to save us. I stuffed newspapers in the corners of the living room and lit them with a tiny light of a match. We stood back, watching the flames leap waist-high into the air. Debra clapped, and I leaped to the rhythm of the flames. We were so happy that when Rick returned from the sun porch with a crate of cherry tomatoes, I had no qualms about having a war inside the house.

"You missed, Kraut!" I shouted to Rick as I rolled from behind the couch to the stuffed chair. I looked over the chair, dodging the tomato bullets. Finally, one splattered my T-shirt, and I feigned death, then rose again. "You dirty coward," I screamed. "I have two more lives."

The blood of tomatoes stained the walls, dripping seeds that reminded me of my sister's baby teeth. Pete, our yellow canary, beat his head against the bars of his rusty cage, terrified. The fire burned down to ashes that floated in the air.

We were happily exhausted. Debra fell asleep, and I dozed in the bedroom, only to wake to Rick screaming that it was my fault. Mother was home, and the first thing that leaped to my mind that might save me from the biggest butt-whipping since the beginning of the world, was magic.

I looked in the kitchen, the air still dark with floating ash. I wanted to tell Mom about how Rick could sneeze bottle caps, but decided she wouldn't listen. Snot ran from Rick's nose as he cried. A lump of hair stood up on his head from being yanked. Mom looked with eyes of fire at me, and I said sheepishly, "Mom, I can tie my shoes now."

I hurried to the bedroom for my shoes, sobs choking my throat like a whole loaf of bread. I was wrapping the laces around my ankles when, by magic, I dodged my mother's belt and scrambled out the window, with only one of my lives gone. ■

Gary Soto is a poet, essayist and short story writer who lives in Albany. These essays, which will appear in This World every other week through the summer, are from his new book, 'A Summer Life.' © 1990 The University Press of New England.

CREEPY · CRAWLY 1990

Entomologist Gaye L. Williams holds a large-scale model and a preserved cicada

Mormon crickets in Nevada, killer bees in Texas, Medflies in California and Florida, yellow jackets in South Lake Tahoe and aphids in Los Angeles make this the year of the insect

BY ASHLEY DUNN

For those bugged by bugs, consider the plight of Big Foot, Illinois. In late May, millions of sausage-sized bugs called cicadas emerged after 17 years underground, covering the town and surrounding countryside in a crunchy carpet of wailing insects.

Or how about the poor people of Brownsville, Texas? There, after years of "killer bee" headlines and occasional spottings, the long-feared Africanized honey bee finally just might arrive in force this summer. Consider, too, the plight of South Lake Tahoe, where the Chamber of Commerce, bracing for an onslaught of meat-eating yellow jackets, has distributed kits of poisoned canned fish to kill off the pest.

Add to the list munching armies of Mormon crickets in Nevada, fire ants in Texas and 11 other states, Medflies in California and Florida and, in Los Angeles, the worst aphid infestation in a decade, and it all adds up to one creepy (crawly) year.

There are many reasons. Dry weather in the West, cyclical insect population explosions in the Midwest and other entomological mysteries all have contributed to this unnerving confluence of bug outbreaks across the nation.

There are few, if any, direct connections between the infestations, but some entomologists find common themes in the uncommon outbreaks. For example, they say that concerns about pesticide usage have complicated eradication strategies. Also, exotic bugs once confined to faraway lands are hitching rides into this country via travelers, and officials concede there is no way to keep the gate shut tight.

"It's a symptom of our times," said Roy Cunningham, a U.S. Department of Agriculture entomologist and one of the world's top experts on the Medfly. "We're all exchanging our diseases and insects."

He and others said that the sheer variety of this year's outbreaks, coupled with a growing public awareness of the costs and effects of the various onslaughts, have placed insects in the limelight as never before. Entomologists, who once spent entire careers laboring in obscurity in bug-filled laboratories, have found themselves thrust into the public arena with the livelihoods of farmers and city dwellers hinging on their decisions.

Cunningham, chairman of the scientific panel guiding the Medfly eradication in California, said that he cannot recall a time when he has been attacked, praised and pursued in such a frenzied manner.

"Mother never told me it would be like this," he said.

Cunningham is one of five scientists advising California as it attempts to eradicate the Medfly from Southern California, perhaps the most visible of several such campaigns being waged nationally against various pest.

In fact, Southern California has become the nation's unofficial exotic pest capital. Three years ago, agricultural officials in California reported finding eight different types of exotic fruit flies in Los Angeles and Orange counties; the bugs hail from as far away as Pakistan, Thailand and equatorial Africa.

There was even one fly found that experts still have not been able to identify. The only place in the world it has been recorded is downtown Los Angeles.

"It's the final irony in how wacked-out things have become," said Eric Fisher, one of the California entomologists in charge of identifying exotic pests.

As entomologists scramble to meet the threats from Medflies, cicadas and the like, they have been forced to contend with increasing environmental and health concerns. For example, protests against repeated malathion spraying in Southern California have spooked state officials to the point where some worry that even a single urban pesticide spraying soon will be politically impossible.

Some of science's best weapons against insects, such as DDT, the old backbone of mosquito eradication, have been banned for years because of damaging environmental effects. Government regulations to protect water and air have also restricted the use of chemicals against pests.

"The rules of the game have completely changed," Cunningham said. "We have so much more to deal with today."

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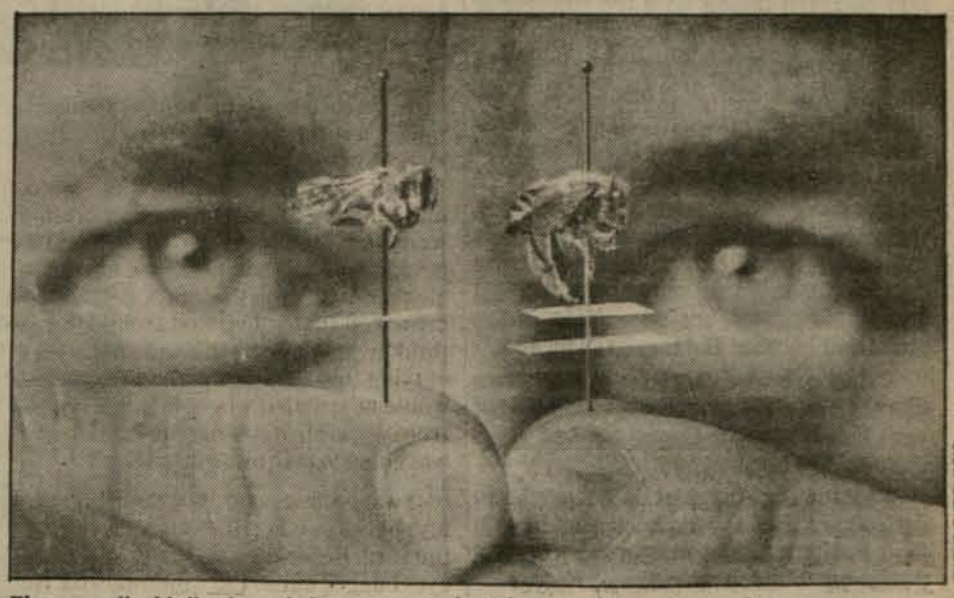
BY CALTECH

A Medfly, magnified 20 times



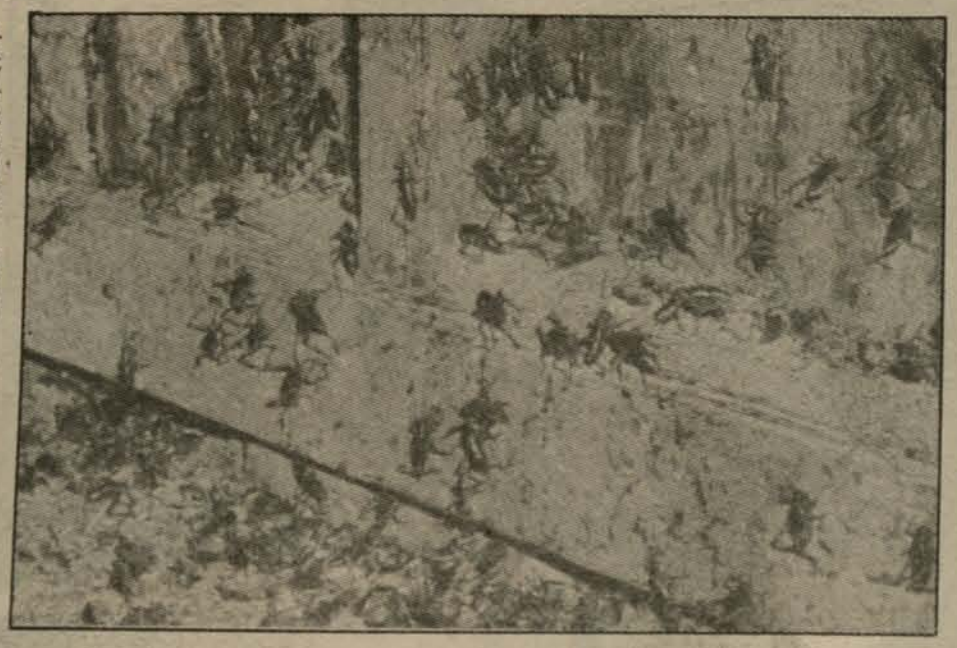
BY THE CHRONICLE

The so-called killer bee, left, contrasted with an ordinary honey bee

CREEPY CRAWLY

Continued From Page 13

The Mormon cricket is Nevada's largest infestation since the 1930s and now covers about 700,000 acres. If the infestation continues to grow, Nevada's $66 million hay crop could be chewed to pieces.



The concerns about pesticide use and science's increasing understanding of its effects have forced officials into a delicate balancing act between the risks to agriculture and the public health risks. There are often no clear answers.

"It's so much harder today," said University of California at Davis entomologist Richard Rice, another member of the Medfly Science Advisory Panel. "We can't just give up and go back to nature, but we also have to be concerned about the health and ecological effects. We all wish sometimes for simpler days."

In the meantime, there seems to be no shortage of pests. At present, farmers in 32 states are now operating under federal quarantines for various pest infestations.

Entomologists figure that the Medfly originally was brought into the United States by travelers or immigrated in a package of infested fruit from Asia, Africa or Central America. Those countries were infested in the same way years ago by the Medfly, whose ancestral home is in North Africa.

Sometime this summer, the king of the exotic pests — the tabloid's "killer bee" — is expected to reach the United States after three decades of migrating through Latin America. The bee originally was brought from Africa to Brazil in the 1950s by a geneticist, hoping to breed a better variety of bee. Instead, 26 swarms escaped and their progeny have been moving northward ever since.

The bees have been migrating at a pace of about 200 miles a year, and last year several swarms were trapped about 150 miles south of Brownsville, located at the southern tip of Texas.

"They'll be here," said Dan Clair, an entomologist with the Texas Department of Agriculture facing a double barrelled infestation from Africanized honey bees and fire ants from Brazil. "There's no way to stop them, really."

Clair said that the prospect of living with the "killer bee" is not as horrifying as the name suggests. While the Africanized bee is more aggressive than others, they will not attack unless provoked.

"There are people panicking for no reason," Clair said. "It's just unnecessary. That's what worries me."

Homegrown pest outbreaks can be equally unnerving. One of the biggest bug explosions of the year took place this spring in southern Wisconsin and northern Illinois with the emergence of a bug called the cicada.

The cicada, which can grow in length to an inch and a half, is a black-bodied, orange-winged and red-eyed, flying creature that lives for 17 years — the longest life span of any known insect.

In one of nature's strangest spectacles, this particular cicada spends almost all its life underground only to emerges at the end for a month-long orgy of sex and egg laying. No cicadas are seen again in the area until another 17 years have passed.

"They've been doing it for as long as we can tell," said Ed Arnold, an entomologist with the Wisconsin Department of Agriculture. "No one knows why."

Fortunately, the pest is no threat to agriculture. But the male cicadas have a loud mating call that in chorus becomes a deafening, buzzing whine.

"It's the most maddening thing," Arnold said. "You think there's something wrong with your ears.

"They make a pretty good splat on your windshield, too," he added.

Given its mysterious life cycle and the brief but intense havoc the bug can create when it emerges, newspapers and television stations have been vigorous in their coverage of the cicada onslaught. The emergence process was reported like an approaching typhoon. The Chicago Sun-Times has even set up a cicada hot line, which the newspaper says receives at least 60 calls a day. One publication presented cicada recipes (sauteed in butter is popular).

Arnold said no steps are taken to control the cicada, as they pose no threat to agriculture.

Elsewhere in the nation, agricultural officials have found themselves facing potentially threatening infestations that could take years or even decades to eradicate.

Consider the case of the voracious, 2-inch-long Mormon cricket, which since the beginning of March has been pouring out of the mountains of northeastern Nevada in roving bands that stretch as long as 10 miles. The cricket infestation is Nevada's largest since the 1930s and now covers about 700,000 acres. If the infestation continues to grow, Nevada's $66 million hay crop could be chewed to pieces.

Sixty years ago, cricket eradication crews stalked the land, dumping a lethal mixture of lime and arsenic to kill the pest. It took nearly 15 years before the outbreak subsided. This time around, eradication workers have largely relied on ground treatment with wheat bran laced with an insecticide called, carbaryl, to kill the bug.

Aerial spraying is less costly and more effective, but federal regulations prohibit spraying within 500 feet of water, ruling out the technique in the mountain canyons, which are filled with natural springs and streams.

"Right now, we're just putting out fires," said one Nevada official.

Dick Rowe, a deputy director in the Nevada State Department of Agriculture, said the Mormon cricket outbreak probably was caused by four years of drought. Rain and cold weather in the spring is usually enough to chop down the number of crickets, but this year's mild weather has allowed the bug population to explode.

Rowe said that eradication workers have been scrambling to keep the bugs off Interstate Highway 80 and out of towns, such as Winnemucca, although they pose no serious threat to humans.

"You know, people will freak out," Rowe said. "They're long, black and as big as your thumb. That's a problem."

While pesticide spraying can wipe out troublesome infestations, it can create problems of its own. Kenneth Hagen, professor of entomology at the UC Berkeley, said that some of the worst insect outbreaks he can remember occurred in the 1940s and 1950s with the increased use of DDT.

The insecticide killed the pests it was after, but it also killed plenty of other varieties, upsetting the delicate ecological systems that naturally contain bug populations.

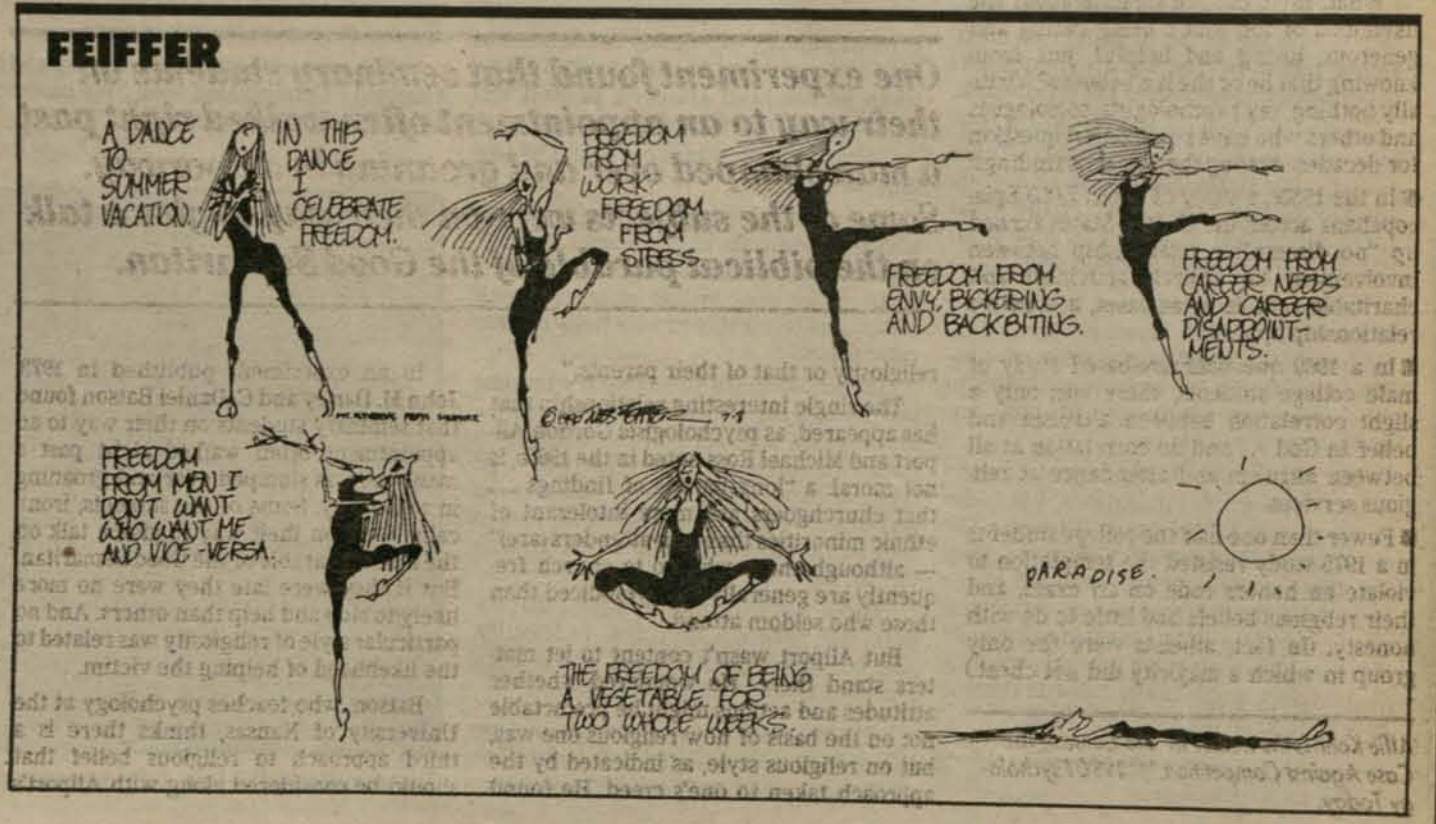
"Those were really spectacular years for outbreaks," Hagen said, recalling the hordes of spider mites and aphids that burst around the country.

Entomologists said that despite the variety of infestations around the country, the size and number of outbreaks is nothing to panic about.

"These things come and go," said Hagen.

Ron Prokopy, a entomology professor at the University of Massachusetts, said that when viewed in historical context this year's infestations are hardly worth noting. In the early 1930s, for example, the entire southern United States was infested with a pest called the screw worm fly, which killed livestock by burrowing into the animal's flesh. It took 40 years to eradicate. ■

FEIFFER



Between God and Good

Research shows believers are no more likely to love their neighbor than nonbelievers

BY LOURDES LIVINGSTON/THE CHRONICLE

BY ALFIE KOHN

Living in a society that teaches us to associate morality with religion, it is easy to assume that a strong relationship exists between piety and pity, between God and good. After all, the sacred texts of Judaism and Christianity, as well as those of most supernatural belief systems, remind believers to be compassionate and charitable.

But by encouraging their believers to think of themselves as chosen people or as possessing absolute truth, and by teaching that humans are natural-born sinners who need salvation or enlightenment, religions often send a darker message too. As Bertrand Russell wrote, "The more intense has been the religion of any period and the more profound has been the dogmatic belief, the greater has been the cruelty and the worse has been the state of affairs."

The evidence of these contrasting messages is plain. Consider on the one hand the commitment to social justice of Gandhi, the Reverend Martin Luther King Jr. and contemporary champions of liberation theology. But also consider the religious bigotry and wars fought in the name of some god, from the Israelites who "utterly destroy(ed) the men, women and children, of every city" (Deuteronomy 3:6) as they invaded Canaan, to the barbaric Christian crusaders to today's fanatic Shiites.

What, then, can we surmise about the likelihood of someone's being caring and generous, loving and helpful, just from knowing that he or she is a believer? Virtually nothing, say psychologists, sociologists and others who have studied that question for decades. Among the research findings:

■ In the 1950s, a study of about 2,000 Episcopalians across the United States turned up "no discernible relationship between involvement (in church activities) and charitable acts. In some cases, a negative relationship appears."

■ In a 1960 questionnaire-based study of male college students, there was only a slight correlation between altruism and belief in God ... and no correlation at all between altruism and attendance at religious services.

■ Fewer than one-half the college students in a 1975 study resisted the temptation to violate an honors code on an exam, and their religious beliefs had little to do with honesty. (In fact, atheists were the only group in which a majority did not cheat.)

Alfie Kohn is the author of 'No Contest: The Case Against Competition.' © 1990 Psychology Today.

Religion was also irrelevant to their willingness to volunteer time with retarded children.

■ In 1984 a researcher who interviewed more than 700 people from different neighborhoods in a medium-sized city expected to find religious people especially sociable, helpful to their neighbors and likely to participate in neighborhood organizations. Instead, she found that religious involvement had nothing to do with these activities.

■ In their new study of people who rescued Jews from the Nazis, Samuel and Pearl Oliner found that "rescuers did not differ significantly from bystanders or non-rescuers with respect to their religious identification, religious education and their own religiosity or that of their parents."

One experiment found that seminary students on their way to an appointment often walked right past a man slumped over and groaning in a doorway. Some of the subjects were on their way to give a talk on the biblical parable of the Good Samaritan.

The single interesting relationship that has appeared, as psychologists Gordon Allport and Michael Ross noted in the 1960s, is not moral: a "long parade of findings ... that churchgoers are more intolerant of ethnic minorities than non-attenders (are)" — although those who go to church frequently are generally less prejudiced than those who seldom attend.

But Allport wasn't content to let matters stand there. He wondered whether attitudes and actions might be predictable not on the basis of how religious one was, but on religious style, as indicated by the approach taken to one's creed. He found that people committed to the intrinsic value of their beliefs turned out to be more tolerant of minorities than those who were mostly interested in what they could get out of religion for themselves — an extrinsic approach. Least tolerant of all: people whom Allport had identified as "indiscriminately pro-religious," those who consider anything involving religion to be good.

Other studies suggest that people with an intrinsic orientation are more likely than others to describe themselves as helpful or empathic. But do they actually help more? Is there any approach to religion that is reliably associated with a greater willingness to assist others in need, compared with other religious styles or with no religion at all? Apparently not.

In an experiment published in 1973, John M. Darley and C. Daniel Batson found that seminary students on their way to an appointment often walked right past a man who was slumped over and groaning in a doorway. Some of the subjects, ironically, were on their way to give a talk on the biblical parable of the Good Samaritan. But if they were late they were no more likely to stop and help than others. And no particular style of religiosity was related to the likelihood of helping the victim.

Batson, who teaches psychology at the University of Kansas, thinks there is a third approach to religious belief that should be considered along with Allport's intrinsic and extrinsic categories. He calls it the "quest" orientation, which describes the sort of person who is "interested in religious questions but suspicious of easy answers," unafraid to challenge and doubt his or her own beliefs.

Batson has not been able to find a clear link between the quest dimension and frequency of helping, but he does believe that people scoring high on this measure may have a different style of helping and different motivations for it. Specifically, they seem to be inclined to help only people who ask for it rather than insisting on rescuing everyone, including some who may prefer being left alone.

In a recently published study Batson and six student collaborators made it difficult for subjects to qualify for the privilege of helping someone in need. The rationale was that people who just wanted to feel good about themselves (or avoid guilt) might volunteer to help but wouldn't try very hard to qualify. Batson found that "questers" were no more eager to help than others initially, but that those who did volunteer worked harder than others to earn the chance to actually help. Unlike people with an intrinsic or extrinsic approach to religion, their motives seemed genuinely altruistic.

Not that a search for religious truths always goes hand in hand with altruism. For one thing, there is some evidence of a slight negative relationship between the quest orientation and empathy. (Are such people more committed to principles than to people? It's hard to say.) For another, the quest dimension is constructed so that anyone, including atheists, will score high if he or she continues to struggle with the big questions about human existence.

The only thing that does seem clear from the research is that no version of religious belief offers an ironclad guarantee that its followers will follow the Golden Rule. ■

SHOCKWAVE

Continued From Page 11

ducing like a virulent cancer, jamming Internet with resource-sapping copies of itself. Graham was stunned. He had thought the project was far off in the future.

"RTM, you idiot!" he yelled, angry at his friend for "blowing" such a great idea. Then he asked, "How did this happen?"

"Well, you remember the (survival) number I picked?"

The two worked on possible cures. It was nearly midnight, and the worm had been racing through Internet for four hours. Graham suggested that they create a Pac-Man cannibal worm to gobble up the worms. "I didn't do that, because I had messed up with the first one," Morris later testified.

The two couldn't agree on a strategy, and the conversation ended. Graham went to Sudduth's office practically bursting with his secret.

"Robert wrote the virus," Graham said, "and it's taking over every computer in the country!"

Sudduth punched out an electronic-mail message. Though surprised that Morris wasn't doing more to stop the worm, he guessed his friend was finding it hard to admit that "something he created was out of control." Morris phoned back and told Sudduth how to stop the worm from spreading on Harvard's computers.

Later, at about 1:30 a.m., Morris called Sudduth from his home phone. The two decided that Sudduth should publish the worm antidotes on Internet — anonymously.

"I was scared," Morris later testified. "I knew people would be annoyed about this because it was causing problems, and I *wasn't particularly eager to catch the* blame for this at that time."

Why didn't Morris send the warning?

"Well, I was at home," testified the driven programmer, who had been known to work till dawn. "I don't have computer access at home. I suppose I could have walked back to Cornell at 2 in the morning ... but even then I wasn't sure I could get access to the network." Critics later questioned why Morris didn't simply telephone computer experts at Berkeley or MIT, but somehow, after having grown up on line, in the electronic net, that direct, non-computer solution seemed to have escaped him.

Friends have a simpler explanation. Morris, quite unlike his hero, the Shockwave Rider, was simply "frightened out of his wits."

" 'Precipice is going to be attacked with nukes at 0130!' [The Shockwave Rider] launched into a burst of furious activity, punching his board with fingers that flew faster than a pianist's. '... Run like hell — because this may not work!' "

Sudduth worked to get the word out. By now, the system was clogged. The only connection he could find was to a bulletin board at Brown University, hardly a center for Unix or Internet. The tired system manager typed out the antidote, describing how to close the holes and protect against new attacks, ending with the odd phrase, "I hope this helps, but even more, I hope it's a hoax."

At about 4 a.m., Sudduth finally dragged himself to bed. Computer centers around the nation were in the process of shutting down the relay centers that might pass the worm — and its antidote. His friend had already been fast asleep for two hours.

The next morning, Morris worked on some school work he had neglected and "just generally tried to relax." In the evening he went to choir practice.

Almost 24 hours had passed since he'd released the worm. When he returned to Upson Hall, he logged on to read his mail. The system seemed to be working fine. Morris read several Cornell notices about a "loose virus" that seemed under control, although users were warned to "be careful." He also read some notices from Keith Bostic about patching security holes that the worm had used and a message from Paul Graham asking him to call. There was something else Morris did at Upson Hall on November 3. "Yes, I believe I cleaned up some of my files."

"By 'cleaned up,' you mean you deleted some of the files?" probed the prosecution.

On the day before the verdict, a Harvard professor warned that 'if Robert had wanted to do damage, there would have been nothing left. All the computers would have gone up in smoke!' Someone else suggested that if Morris were 'unjustly punished' it might inspire a less idealistic hacker to 'do it right.'

"I deleted some of my files, yes."

"And that copy of the virus you left on your account, that was encrypted, that was in an encrypted form, wasn't it?"

"It was. Yes."

Once again, Morris left Upson Hall and returned home to make a phone call. Graham excitedly informed him that the worm and disclosure of its staggering impact "was about to get into the newspapers, and that it might be a big sort of media event."

Morris "screwed up" his courage and called his father, the computer security expert, because he "felt that he ought to know." Morris Senior was not amused. He told his son to go home and not to talk to anybody. "So then I went to bed and I left Cornell the next day," Morris testified.

But the true Shockwave Rider never abandoned the front line. With a nuclear bomber zeroing in, he bravely hacked out the commands to avert the attack:

"And you did it in less than ten minutes?"

"Looking back on it, I feel I had all the time in the world."

Meanwhile, Morris was retreating, though not as smoothly as planned. One of his friends had inadvertently let RTM's log-on and nickname slip to John Markoff, a reporter from the New York Times who happened to have written extensively on computer security and who counted among his friends one of the nation's leading computer security experts, Robert Morris Sr.

The reporter used an Internet account to "Fingerd" RTM, and the program faithfully flashed the name Robert T. Morris. When the reporter called Morris Senior and noted the similarity of their names, the elaborate "experiment" unraveled. Morris Junior's secret trail of anonymous accounts, red herrings and encrypted files suddenly became the machinations of an adolescent playing war games.

Officials at MIT estimated that 6,000 of the nation's 60,000 Internet computers had been invaded. The country's top computer experts spent several sleepless days and nights battling and cleaning up after the attack, while tens of thousands of military and university researchers went without computer power. (Blocked at the relay point, Sudduth's antidote had not been delivered for two days.) The tab for the wasted time and resources was estimated at $15 million.

Three days after the attack, the New York Times began a series of front-page stories about the missing Internet attacker, Robert Tappan Morris. While Morris maintained a public silence, ordered first by his father and then by his Washington, D.C., attorney, the FBI began an investigation, and government and university officials harshly criticized the hacker.

Old Bell Labs colleagues like Douglas McIlroy were puzzled by their progeny's slip. "What I don't understand is the secrecy part of it. All of the juvenile tricks, encrypting source files to launch from some other machine, encrypting the program," says the scientist. "That's not consonant with a fun-loving kid."

Yet many computer security experts — some of them friends and former associates of Morris Senior — rose to Morris Junior's defense. They said his experiment was a harmless, overdue warning of gross gaps in computer security, and argued that Morris should be cheered, not convicted.

"When all is said and done, this kid is going to come down as a folk hero," Peter Neuman, a computer security expert at SRI International (one of Morris Junior's former employers) told the New York Times.

Of course, the hacker is the hero — in fiction. The Shockwave Rider liberates the masses from a corrupt, computer-controlled government, with a freedom-fighting worm, risks his life to foil a nuclear attack, wins his girl's heart and is praised by the world. But Morris had no such righteous intentions. He had no social or moral agenda, and never intended to expose Internet's well-known security limitations. His worm had no other purpose than to spread as far and wide as possible, and if it had spread as planned, slowly, innocuously, most say the response would have been even greater panic.

The world that Morris' work entered was far removed from his boyhood computer security training in the hallowed research halls of Bell Labs. In the decade since his code-cracking childhood, computers leaped into the mainstream to become the foundation of business and commerce. Assaults on computers became assaults on industry, and by the mid-1980s terrorist computer attacks and malicious break-ins revealed the dark side of hacking, forever ending the playful era of his father, when hacking was a rite of passage.

Therein lay the irony and tragedy of the trial of Robert Morris. He was being tried for what he was taught by his father, his institutions and his generation: access, unauthorized. The trouble was, as the would-be security expert wrote in one of his early papers, "Times have changed."

Some were not prepared for the change. On the day before the verdict, a Harvard professor warned that "if Robert had wanted to do damage, there would have been nothing left. All the computers would have gone up in smoke!" Another Harvard friend suggested that if Morris were "unjustly punished" it might inspire a less idealistic hacker to "do it right." The reasoning was similar to Morris' main line of defense.

"Was it your intention to have the worm program destroy or damage any files?" asked the defense attorney.

"No, it was not."

"Was it possible for you to do that?"

"It would have been easy to do that."

The implication was ominous, and at least one close friend of Morris' was not convinced that everything was OK just because his bored buddy hadn't pulled the trigger. "On some level I know why he did this, and on some level I don't," says Kuperberg, glancing away and pacing like the old roommate he struggled to defend. "On some level, (Morris Senior's explanation of boredom) is not satisfactory."

No answer seemed likely to come from the one person who might know. After the guilty verdict was issued in his trial, Morris and his attorney walked past the jostling TV crews and newspaper reporters and into the winter night.

"What would have been great is if he had shut the holes after himself. That would have been a coup," says Peter McIlroy. "If he had thought of that, I think he would have done it."

But RTM wanted nothing of the sort. In the private war he waged it was his duty to hold on to the holes, to wield them in the way he "knew they wouldn't mind."

And Robert Tappan Morris? He was just a kid:

"He might have been trained to display such powers of judgment; he might have been specially bred to possess them. One thing was sure, he hadn't lived long enough to grow into them."

— The Shockwave Rider ■

Endangered Rangers

Environment
HAROLD GILLIAM


BY BRIAN CROGAN/SPECIAL TO THE CHRONICLE

A horse patrol ranger assists a hiker in Yosemite National Park

'Being roughly 28 percent behind the civilian pay scale just doesn't cut it anymore. I'm sick and tired of being paid in sunsets.'

There's a first-magnitude scandal in the National Park Service, much more shocking than the flap over the tidy profits being made by some corporations running concessions in the parks.

It concerns the group of people who have probably been the most universally respected employees of the federal government — the park rangers, those friendly men and women in the natty green uniforms who take care of the parks and give walks and talks on the wonders of nature and history. Former Senator Barry Goldwater once said that the National Park Service staff represented the finest type of public servants.

The scandal is that these dedicated rangers are being exploited unmercifully; they must work for unbelievably low wages that cannot provide enough for most of them to support a family in decent fashion.

Look at the figures. Park rangers usually begin their jobs at what the government calls grade GS-4, which pays $14,573 a year, or $7 an hour. By comparison, an average unskilled manual laborer in San Francisco, without training, background or experience, receives close to $9 an hour — roughly $4,000 a year more than a ranger.

If rangers can survive on that handsome wage, they may eventually make a little more. Most rangers are GS-5 or GS-7, with starting pay at $16,305 and $20,195 respectively. After about 20 years on the job, they might get as much as $21,201 to $26,252. The latter is less than half of what a bricklayer makes in New York City. A national park ranger-supervisor receives less than an average truck driver.

Fringe benefits are minimal. Even in government housing, much of it dilapidated, the rents are as high as in the private market. Permanent employees have medical insurance (dental not included), but their skimpy salary is docked for part of the costs.

About half of the national-park rangers are seasonal; on an hourly basis they make about the same as entry-level GS-5 employees, but they have no medical insurance or pension benefits and cannot receive pay increases, no matter how long they have been on the job.

Ranger George Durkee, for example, has worked for 20 years as a seasonal back-country ranger in Yosemite and Sequoia-Kings Canyon, where he puts in 12 hours a day seven days a week with no overtime pay. He gets $8,000 for about five months' work, supplemented by some $5,000 he is able to earn in the snow season at Yosemite's Ostrander ski hut.

In a recent San Francisco speech to the Commonwealth Club, executive director Martin J. Rosen of the Trust for Public Land cited the miserable pay scales and said: "Maybe the rangers' children never need their teeth straightened or need tutoring or music lessons. I would hope not because, if so, wages from the park service aren't much help. I am troubled by this exploitation because it means that we cannot for the long term hope to compete for and retain the most qualified, dedicated men and women to defend and restore this land."

Contrast the $14,573 starting wage in the park service — or the $16,305 received by first-year G-5 rangers — with the pay in California state parks, where the starting salary is $21,106, or in East Bay Regional Parks, where rangers begin at $28,332, or, if law-enforcement activities are involved, $31,572.

Law enforcement has come to be an increasing burden on the rangers. "One of the most critical law enforcement problems facing us," says Durkee, "is the increase of poaching, where illegal hunters are stripping parks of wildlife. In 1988 serious crimes such as poaching, possession of stolen property, assault and drugs accounted for more than 80,000 investigations and 9,000 arrests. There were 68 assaults on rangers. In our spare time we also look for lost Boy Scouts and rescue the climbers dangling off sheer cliffs."

Last year the Association of National Park Rangers surveyed its members and reported these comments:

- "I have to work many hours of overtime just to eke out an existence, buying clothes at thrift shops, baby needs at clothing exchanges and food at retail warehouses."
- "Currently, we can save less than $20 a month. My child will never be able to go to college. I'll probably never be able to own my own house, and I look forward to retirement thinking how will I manage when I can barely make it now."
- "Living here, I have run through my life savings in a matter of two years."
- "My wife works part-time at two or three different jobs in order for me to afford my expensive hobby of being a park ranger."
- "I realize that my skills and talents, being average, are being squandered in a service that starts people off ... for just $1 more per hour than a clerk at a McDonald's. Being roughly 28 percent behind the civilian pay scale just doesn't cut it anymore. I'm sick and tired of being paid in sunsets."

William Penn Mott, who during his long career has been director of East Bay Regional Parks, California State Parks and the National Park Service, says that his appeal for better pay for national park rangers went nowhere.

Officials of the Office of Personnel Management replied: "You don't have any problem in recruiting rangers, so why are you making this an issue?"

"That's true," he responded. "There's a waiting list for people to become park rangers, but the quality of the people applying is not as high as we'd like. The other problem is that they come into the service and are all fired up, then they find the pay scale won't support them and the turnover is very rapid."

The OPM people were not impressed. "I looked into this thing," Mott says now, "and I was absolutely shocked to find that some of our rangers, particularly those working in high-rent areas, in order to make a go of it, had to go on welfare."

The present National Park Service Director, James Ridenour, told Congress: "... The Park Service is losing its ability to compete, especially for the pool of young, highly qualified recent college graduates."

The park service's chief ranger, Walter Dabney, based in Washington, D.C., comments: "We're losing dedicated people very fast because they can't afford to stay. Last year we lost 15 percent of our GS-5 people. That's a tremendous turnover; it represents a lot of training, knowledge and expertise. Who do we want greeting the world at the Washington Monument, people who can't do anything else? Who do we want taking care of the nation's irreplaceable treasures, the lowest bidders or people of high caliber?"

One reason for the preposterous situation of poverty among the keepers of the parks is that there are currently no powerful members of Congress who are vigorously supporting the national parks as a top priority.

Trust for Public Land's Rosen told the Commonwealth Club that national park rangers need "champions of their cause ... who will step out, speak up and address the urgent and immediate need to raise the wages and expand the ranks of our park professionals."

Otherwise, we might be confronted with something like the fantasy of P.J. Ryan, who works at Jean Lafitte National Historic Park in New Orleans and watches the perennial summer TV specials on "Our Endangered National Parks."

He dreams of the day when the park ranger who is customarily used as a prop in these specials suddenly grabs the TV announcer in a headlock and roars: "Listen, you, I'm one of the endangered species you're talking about! Unless I'm paid an adequate wage and living conditions, I'm going to start vanishing like the other species!" ■

Se Habla Rip-Off

John Reid
SOCIETY

It slices! It dices! And tha-a-a-at's not all: *Se habla Español!*

The TV schlock commercials — once banished to late-night slots on English-language independent TV stations — are now aired at all hours on Univision's Spanish-language affiliates.

Emilio Nicholas, who runs the Los Angeles Univision affiliate, KMEX, says the scarcity of Spanish mail-order catalogs is one reason for the effectiveness of direct-response ads. The tube can be the best access many, especially monolinguals, have to American merchandise.

Ads appear on the screen for such goods as a gold cross that contains drops of holy water from the Grotto of Lourdes

On a typical afternoon, a series of easy-to-remember phone numbers fills the screen for goods and services ranging from personal injury lawyers to an evangelical revival on videocassette, to a gold cross that contains drops of holy water from the Grotto of Lourdes. Batteries of Spanish-speaking operators await your call, and if you're not completely satisfied . . .

Many are not. A Spanish hotline was set up last September by San Francisco radio station KCBS for their consumer show, "A Call for Action," which airs every weekday from 11 to 12 in the morning. The show was well advertised on Channel 14, the Bay Area Spanish station, and the calls flooded in, including complaints about products advertised on Channel 14. "We have been to them (Channel 14) about certain products," said Barbara Kaufman, who directs the consumer advocacy program.

Whatever the offending goods were — odorless perfume or overpriced cookware, she can't remember which — the ads were pulled. That, explains Nicholas, is all a station can do: react, not pre-empt. "We are not allowed to discriminate by product," explains Nicholas, saying that as long as the thing looks like it might work, he has to hawk it.

The Dial-O-Matic looked like it would to Victoria Rodriguez of San Francisco. In the ad, the nifty little machine sliced the vegetable of your choice perfectly with a simple twist of a selector knob. "It looked nice, it looked so easy," said Rodriguez. So she mailed off her $32.95 and waited.

Pretty soon, she had her very own Dial-O-Matic, a machine that didn't even begin to chop a carrot. Numerous complaints ensued to polite Spanish-speaking operators at K-5 Leisure Products, in Plymouth, Minnesota, who assured her that her complaint was "in the computer."

"I demanded my money, and after a month, I received another Dial-O-Matic," she laughs. "They're just terrible people." The consumer radio show suggested she threaten to call the district attorney in charge of consumer fraud, and that finally did the trick. Two months after placing her order, Rodriguez got her money back.

"Why do they use our people to sell that junk?" she asks. "It's awful, they use Spanish people." Rodriguez, who immigrated from Mexico as a child and has lived in the United States for decades, thinks, despite her Dial-O-Matic episode, she's less prone to rip-off than newcomers. Consumer advocates say there is no evidence to show that any one group is more gullible than another. Spanish language TV, with 15 million weekly viewers, has simply become an important — but still affordable — vehicle for direct-response advertisers.

Many of the products seem tailored to a broad concept of a Hispanic sensibility. A videocassette tour of the pre-Colombian ruins of Latin America courts an immigrant's nostalgia for roots. The Lourdes holy water cross is a portable pilgrimage. And the "Road to Heaven" children's book series teaches the Catholicism that still unites many Latin American populations.

And then, in the good old American snake-oil tradition, there is the Balance Bracelet. "Did you know that over 100,000 Hispanics have benefited from the effects of the Balance Bracelet?" confides a young woman walking in front of a windswept screen. The bracelet revolves, suspended on the screen, and bracelet owners testify to the changes wrought in their lives as a result of wearing the bracelet, changes that seem cheap at $29.95.

Who can resist?

The man at the other end of the 1-800 number explains in Spanish: "It has helped a lot of people who suffer from . . . what's it called . . . nervous tension." Asked how it works, he says, "It's all in the special combination of seven metals (imported from Europe)." Then the stumper: "What seven metals?" He consults with the next operator, amid the faint sounds of giggling. Neither knows, but the operator assures the caller gold is one of them. If there are doubts, he counsels, you can always ask one of the many people already wearing "el Balance."

Before hanging up he adds, "It all depends on your faith."

Trust me. ■

John Reid is a reporter for Pacific News Service. © 1990 Pacific News Service.

EARTHWORKS *By John Javna*

Telephone Tips

If you want information about the environment, there are plenty of places you can write to. But many of us would rather pick up the phone, and if you can get information immediately, there's a better chance that you'll use it. Information you get by phone is more likely to be up-to-date, and it's helpful to be able to ask follow-up questions.

So if you want to reach out and touch some wonderful sources, here are numbers you can call.

Energy Conservation

For general questions, try the Conservation and Renewable Energy Inquiry & Referral Service (CAREIRS) at (800) 523-2929. They'll send brochures on insulation, caulking, etc. They'll also try to answer short questions, but they're not experts on every subject. For more technical questions, the Department of Energy has a toll-free hotline called the National Appropriate Technology Assistance Service (NATAS). Call 800-428-2525 (in Montana, call 800-428-1718). Engineers will research your questions. Don't call this line for general information — it's for specific stuff. ("I live in North Dakota and have two inches of fiberglass insulation in my attic. How much more do I need?")

Recycling

To locate a nearby recycling program, call the Environmental Defense Fund's hotline at 800-CALL-EDF (225-5333). EDF will send brochures on home and office recycling, a resource list of publications and organizations, and information on local recycling centers.

Consumer Information

The Pennsylvania Resources Council (PRC), a non-profit group dedicated to educating consumers about environmentally sound shopping habits, has a toll-free line available for answering questions. It's (800) GO-TO-PRC.

Dial-a-Vote

For the latest information on environmental legislation and how you can influence it, call one of these recorded messages in Washington, D.C.:

- Audubon Society: (202) 547-9017.
- Sierra Club: (202) 547-5550.
- National Wildlife Federation: (202) 797-6655 (news updates, as well as issues to write about).

To contact your representatives in Washington, call (202) 225-3121 for the House and (202) 224-3121 for the Senate. An operator will connect you with the right office.

Hazardous Waste

Laidlaw Environmental Services at (800) 845-1019 will provide information on hazardous wastes and help you start a hazardous waste collection day in your area.

Pesticides

EPA's 24-hour-a-day hotline has everything you wish you never had to know about pesticides. Call (800) 858-7378.

John Javna is a Berkeley writer specializing in popular culture. His EarthWorks Group of writers and researchers recently compiled the book '50 Simple Things You Can Do to Save the Earth.' Sources for this column are environmental organizations, government agencies and manufacturers' trade organizations. Please address questions or comments for Javna to: EarthWorks, P.O. Box 419149, Kansas City, MO 64141.
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Drop the Quote, Louie

Language
WILLIAM SAFIRE

In the Washington bureau of the New York Times hangs a framed poster titled "Boulevard of Broken Dreams."

It is a painting by Gottfried Helnwein — inspired by the nostalgia and realism in Edward Hopper's painting "Nighthawks" — of four legendary people in a dreary diner at night.

Working behind the counter is Elvis Presley; sitting on one stool by himself, coat collar turned up, with a white mug of coffee at hand, is an unshaven James Dean; Marilyn Monroe, blond head tossed back in provocative laughter, is seated close to Humphrey Bogart, wearing a bow tie as Rick in "Casablanca," staring glumly at a glass in front of him.

All dead too soon, but their images shimmer in the shared, broken dreams of our national memory.

Make a mistake about the details of the careers of any of them, and a legion of remembers comes at you with an admixture of dismay and delight, mock hurt feelings and a fierce possessiveness of trivia.

We must not get the details wrong; it is a kind of sacrilege, as if any deviation from the recorded history disturbs their ghosts and muddles the misty orderliness of our sentimental past.

"You must be buried under the mail from all the faithful," writes Harvey Glassman of Fort Lee, New Jersey, "who wrote after falling off their chairs from hysterical laughter at your boo-boo. Playing tennis was not one of Duke Mantee's diversions, since the machine gun would have slowed him down."

This, along with so many other letters, is the voice of the Bogart fan — shocked, shocked at the following paragraph in a recent piece by me in the New York Times about the derivation of the word *bogey*:

"To movie buffs, *Bogie* is short for Humphrey Bogart, and the title of this piece — 'Bogie, Anyone?' — is an almost subliminal allusion to the line — *'Tennis, anyone?'* — in the actor's first appearance on stage, in 'The Petrified Forest.' "

"Oh dear, as Edward Everett Horton would have said," writes Roy D. Pierce of Portland, Oregon. "Oh dear, oh dear, oh dear. Bogart's initial stage appearance was made not in Robert E. Sherwood's 'The Petrified Forest,' but in John Colton's 'Drifting' in 1922, 13 years before he played the wanted criminal Duke Mantee."

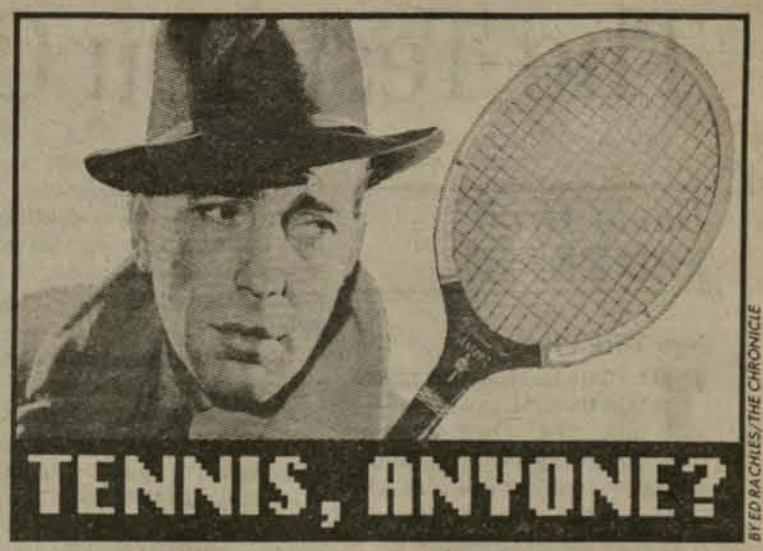
"The phrase *'Tennis, anyone?'* was spoken by Bogart in 'The Circle,' " writes the actress Dorothy Cheney Quinan of Newtonville, Massachusetts. "Actually, 'I say, what about this tennis?' is the way my playbook read when I appeared in the play at the Keene Summer Theatre, regrettably not with Bogie."

There seems to be some dispute here on a phrase that has a hallowed, tension-breaking place in the American language.

Lloyd T. Grosse of Eatontown, New Jersey, sends in this passage from Nathaniel Benchley's biography of Bogart: "Richard Watts Jr. [the drama critic] ... swears that he heard Humphrey, wearing a blue blazer and carrying a tennis racket, come onstage and speak the immortal line *'Tennis, anyone?'* as the playwright's device for getting unwanted characters off the stage, but he cannot now remember the name of the play. Others tend to doubt that the words were ever spoken ... and Humphrey gave a different version every time the subject came up." (Grosse adds, "Shouldn't that be tennis *racquet*?" but I refuse to be sidetracked.)

"The gangster Mantee may have been involved in many rackets," writes Don Koll of New York, "but tennis was not one of them." (OK, it's tennis *racquet*.) "Mr. Bogart had the line (and it may have been 'Anyone for tennis?') in another play in the '20s, probably 'Cradle Snatchers.' "

Koll points out that other famous stage and movie lines are misremembrances: "Mae West did not say, 'Come up and see me sometime' in 'Diamond Lil.' What she actually said was 'Come up sometime and [pause] see me." (Nor did Bogie say, "Drop the gun, Louie" — that was a parody. I have felt the lash of the broken-dreams legion on this type of error before: Write *play it again, Sam* in any context, and the sticklers will send you transcripts showing the line in "Casablanca" to read only *Play it!* — no "again, Sam." Their slogan seems to be *"You must remember this...."*)



Jay Shulman of Scarsdale, New York, reminds us that "Bogart referred to the romantic juveniles he most often played on Broadway as *'Tennis, anyone?'* parts. This anecdote is recounted in Joe Hyams' 'Bogie.' The line itself may have never actually been said."

Was it said? Bartlett's Quotations in its 14th edition lists the phrase as a Bogart quote, his sole line in his first play; in "They Never Said It," Paul F. Boller Jr. and John George wrote that the "actor denied he ever uttered it in play, movie or in person."

Is there no former interviewer who can come forward with a contemporaneous citation, directly from Bogart, on this important two-word expression of la-di-da superciliousness now used as a jocular subject-changer?

Here's a surprise: I am that person. In 1951, as a reporter for the "Close-Up" column in the New York Herald Tribune, I was sent out by my bosses, Tex McCrary and Jinx Falkenburg, to interview Bogart and his wife, Lauren Bacall.

Even then, almost four decades ago, I had phrases on the brain. Here in hand is the yellowed clipping from the file I saved when the old Herald Tribune morgue closed down. I asked Bogie about his first line on stage:

"People forget how I used to look on Broadway," the actor reminisced. "There would be a crowd of charming and witty young blue bloods gathered in the drawing-room set, having tea, while the hero and the heroine get into a petty squabble. The writer couldn't think of any other way of getting excess characters off the stage, so the leads could be alone — and that's where I would appear in the doorway, in my flannels, hair slicked back, sweater knotted jauntily about my neck, four tennis rackets under my arm, breathing hard as I said my line: 'It's 40-love out there. Anyone care to come out and watch?' "

I had just turned 21 years old, but my bosses had taught me enough about reporting to cause me to put the question to the source directly: Did he, Humphrey Bogart, ever use the words *Tennis, anyone?* on stage? His unequivocal reply: "The lines I had were corny enough, but I swear to you, never once did I have to say *Tennis, anyone?*"

There it is, straight from the horse's mouth, settling the argument forever. This is no recollection of mine; it was transcribed in shorthand and written for the newspaper that day. It was as if Fate had put an incipient phrase-dick in the right place with the right question to the right source at the right time.

You may be wondering: If the answer to the origin of Tennis, anyone? had been vouchsafed to me, personally, 39 years ago, why did I not cite it in my piece a few weeks ago?

I forgot, that's why; it went right out of my head. When my recollection was refreshed, it all came back to me, counselor.

Of course, looking back over more than 30 years himself, Bogart may have forgotten — or perhaps he got bored with the frequent question and tried a different answer.

As the Hyams biography indicates, the line in his first show was somewhat longer than two words, and in his recollection to early interviewers, he compressed it into a compound adjective: "*tennis-anyone* roles." That adjectival usage was then treated as the exact quotation, which it probably was not.

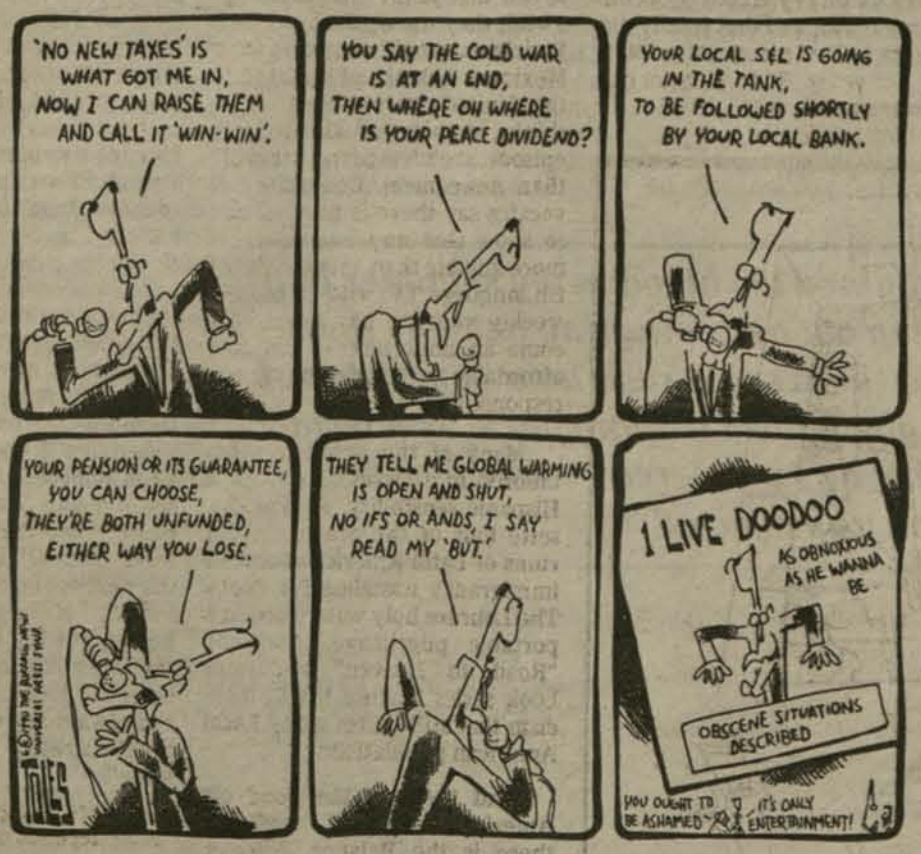
Bartlett's in its 15th edition has made a change — not from the confirmed Americanism *Tennis, anyone?* but a change in the sourcing — to a more accurate *"attributed"* to Humphrey Bogart.

I just read all this aloud to the broken-dreams poster.

Elvis gave an appreciative wriggle, and James Dean's eyes flickered. As Marilyn smiled and squeezed his arm, Bogie said to read it again, Sam. (Here's lookin' at you, kid.) ■

New York Times

TOLES



The Test You Can't Get Ready For

David Groff
END PAPER

New York City

The time had come for me to take the Test, as we gay men call it. "The Test" is part of our succinct new vocabulary of nonwords — PCP, ddI, KS, DHPG, CMV, AZT — all representing either opportunistic infection or treatments for that acronym looming in so many of our lives: AIDS.

For years I had wondered which nonword might ambush me and which series of nonwords could prolong my life. Now I sat on an examining table, my left hand a fist, as the doctor's latexed fingers drew my purple blood into a vial. For years — practically ever since the HIV antibody test had been released in 1985 — I had avoided this moment, avoided knowing whether or not I was antibody-positive and therefore more likely to develop immunosuppression, which could lead to AIDS. Along with my friends, I could justify avoiding the Test. It seemed better to be surprised by AIDS than to live paralyzed by a prospect I was powerless to alter.

That isn't true anymore. Or, as my doctor put it, "Two years ago, if you took the Test and you were positive, all I could do would be to send you to a shrink. Now if you're positive, we still send you to a shrink — but we can intervene."

My rational self agreed with my doctor. If I was positive and if my level of helper cells was suppressed, I could go on AZT, the very toxic drug that seems to counter the virus in some people and that remains the only antiviral approved by the government for widespread standard use. But watching my blood enter the vial still panicked me. I had made the first of a series of decisions that could change forever how I lived my life — if not how long my life might be.

The doctor withdrew the needle, capped the vial, and labeled the tube. On a little form he checked off half the risk groups listed: gay or bisexual male, sexual partner of person at risk, and "other." He scrawled something on an envelope and shoved the vial and form inside. Then he explained where to drop it off, told me a bad joke, bandaged my arm, patted it, and left.

Minutes later I was on the subway from my doctor's office on the Upper East Side, heading down to the Department of Public Health at 26th Street and First Avenue. They would test the blood not confidentially but anonymously — I was identified only by a number — and in two weeks I would visit my doctor again to find out the results face to face.

The vial balanced on top of the papers in my shoulder bag. I imagined the blood rolling out and smashing onto the floor amid the evening rush-hour commuters. I imagined them leaping back, wondering — just as I wondered — whether the blood was infected. I almost wanted the vial to crash and break, then I wouldn't have to deliver it and I would never know. Even though I intended to keep private the fact of my taking the Test, a part of me wanted to appall the commuters — just as I was appalled.

It was after hours, and the lobby to the building was deserted. I asked the guard where Room 102 was, feeling obvious, feeling infected. With a nearly imperceptible and perhaps contemptuous nod he directed me the right way. My question and my situation were ordinary for him.

Room 102 was a refrigerator in a closet. I had expected a bustling clinic of white-coated lab technicians testing the city's blood day and night. Inside the refrigerator, envelopes with vials of blood lay on the trays, each one labeled with a series of medical abbreviations unfamiliar to me. There were hundreds of vials. I laid my blood in gently among them and thought for a long moment before I shut the refrigerator door and turned to leave.

I found a woman in front of me, tall, dressed in sleek black, her hair hidden under a black scarf and her face dead white. She was holding an envelope identical to mine. I met her blue eyes for an instant and then we both looked away. I made my way around her, speculating a little on what brought her here — marriage, prospective pregnancy, a boyfriend, a tragedy. For a moment we were a two-person community of the worried well, eyes averted just like regular New Yorkers. Someone knew my secret, someone knew hers.

When I got outside, the city was beautiful, even this unphotogenic section of First Avenue. The gray lines of buildings and sky seemed like a riot of subtle colors, the horns and headlights a vigorous party. I felt acutely aware of my possibly infected body, how it took up space, how the muscles worked in my legs and how, as a result, I moved. I wouldn't be moving forever, I knew that; someday I would be still. I turned around and saw the woman in black hurrying the opposite way. I wondered if she felt about her body the way I felt about mine.

For the next two weeks I ate bacon cheeseburgers almost daily, a series of last meals. Every time the phone rang at home or at the office, I felt an electric anxiety. My doctor promised he would not call, but I kept hoping he'd break our agreement and phone to say I was negative. That way I could sleep at night. He didn't call.

I grew more obsessed daily. Even though for hours at a time I'd forget to anticipate my test results, my fear would ambush me like a bowel-loosening punch in the gut. I told myself that I wouldn't die the very day the doctor told me the bad news. My HIV-positive friends, and those who had been diagnosed with AIDS, were still alive — mostly. They'd coped. I'd cope too. Cold comfort.

I'd wake up in the middle of the night trying to remember the details of every sexual experience I'd ever had, however minimal the risk of infection might have been. I went so far as to get up at 2 a.m. and scour the phone book to locate those men I'd lost contact with. One name was absent. That was unnerving, because I knew he had been listed and that he owned his apartment and thus wasn't likely to leave New York. Probably he was just unlisted now. But I lay awake the rest of the night wondering if Pe ter was still alive.

Two weeks later, my body feeling oddly light, as if I could still sense the ounce of blood I'd lost, I was sitting on that same examining table, hearing my doctor's low voice from the next room. He was running late, I told myself I'd know how to react, but I knew I wouldn't. I let my eyes focus on a bad watercolor above the sink: a beached sailboat lying coyly on its side in the sand. The pastels were fey but they seemed brilliant to me.

The door opened and my doctor's face appeared, sweaty at the end of the workday, as bemused as usual.

Forgive me, but I will not tell you what my doctor told me.

Imagine for yourself the immense relief, the knot of tension sliced through, the light-headed desire to hug the doctor and laugh. But imagine also the doctor's pronouncement, his optimistic droning about prolonged longevity and further T-cell tests, the spit in the stomach forming a big sickening ball, the disbelief, the thousands of self-steelings. Imagine that different sort of light-headedness.

My antibody status does not matter to you. Certainly it matters to me. But what I'd like you to remember is the blood on the subway, the click of the refrigerator door, the woman in black so elegant and uneasy, First Avenue at gritty, gorgeous dusk, the brilliance of that bad art in the examining room, the pores of the doctor's face all of them declaring, by their very existence: As long and as well as you can, live, live. ■

BY WILLIAM CONE/THE CHRONICLE

I imagined the blood in my shoulder bag rolling out and smashing onto the floor amid the evening rush-hour commuters. I imagined them leaping back, wondering — just as I wondered — whether the blood was infected.

Co-op News

The Bay Area Consumer Weekly

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1984 ANNUAL REPORT

CONSUMER'S COOPERATIVE OF BERKELEY, INC.

GENERAL MANAGER'S REPORT

In 1984, the Consumers Cooperative of Berkeley weathered one of the most difficult periods of its 47-year history. It turned out to be both an auspicious and a traumatic year, a time of triumphs and defeats, of beginnings and endings, of new and old.

In 1984, the Co-op was forced to come face-to-face with many of its failures. The analysis of why Co-op was confronted with such failures may go on for years and there will probably be a lack of consensus on the causes. But it was the real threat of bankruptcy which forced us to take long delayed actions to close four of our 10 centers, leaving many members dismayed and without Co-op services and many long-term Co-op staffers without employment. However, these actions set the stage for Co-op's rebirth and renewal. The resources provided by the sale of two Co-op properties (Marin and El Cerrito) provide Co-op a window of opportunity of about two years to reestablish its financial and marketing health.

With this in mind, the Board of Directors approved a two-year plan for Co-op's redevelopment in April. The plan was the beginning of a formalized five-year planning process which had its second round this fall. In December the board approved a five year plan for the organization. The plan encompasses programs in five critical areas: finance, merchandising, operations, education and personnel.

In the finance area, in addition to closing centers which were losing money, the plan called for the sale of two Co-op properties. At the close of the fiscal year, only one had been sold and the bulk of the funds were used to strengthen the balance sheet by paying off a number of liabilities. The proceeds from the sale of the second piece of property are primarily targeted for re-investment in our existing centers. Unfortunately, this sale has proceeded slowly and we have been unable to carry out all the planned improvements deemed necessary to solve Co-op's most persistent and pressing financial problem: lack of profitability. We do expect this sale to close in the near future. We will then be able to proceed to complete all the projects which have been budgeted.

Nonetheless, no center has been left untouched or unchanged. The Hardware/Variety Center and Natural Foods Center have already gone through complex renovations and emerged much improved. If you haven't visited these centers since their renaissance, please take the time to drop by.

Northpoint, Telegraph Avenue and University Avenue have all had their produce sections remodeled and reorganized. In addition, we have spent much time working on the quality problems in produce identified by you, the members. We have begun a program of direct market buying at our Telegraph center which has also supplied our other centers with a limited number of commodities. We plan to expand on this program in the current fiscal year. Although the deli at the Shattuck center is not completed, construction is well underway and we look forward to a grand opening in February.

In addition to these operational and merchandising changes, the operations staff have been working very hard in three priority areas: friendly service, efficiency, and store cleanliness. We think significant progress has been made here, but in the long run, what we think doesn't matter. What matters is what *you* think, and we need to hear from you.

Our major accomplishment in the merchandising area has been the identification of a market strategy approach which we continue to work on implementing. We have identified ourselves in our grocery operations as the food supplier for sensible, health conscious consumers and those looking for less expensive gourmet items. We have acknowledged that our stores are small by industry standards, and that in order to have the variety in products which our members demand we must apply more careful scrutiny to the products we shelve in order not to confuse true variety with mere brand proliferation. *Quality, value and customer preference will help us make these choices.*

The Merchandising and Education Departments have also extended their advertising/outreach programs. Our Co-op News has been redesigned and is being used more aggressively as an outreach tool. We ran our first television ad campaign on Channel 2 during Co-op Month in October. We have been running our home economists' "Buywords" on radio station KDFC in order to help familiarize a wider audience with what Co-op is.

The Education Department has gone through significant personnel changes this last year which impeded progress. However, with the appointment in

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Discount Coupons —pg. 12

Affordable Housing —pg. 15

5% Member Discount —pg. 17

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from page 1

July of a full-time education director, Co-op education is beginning to move again. (See the education director's report on page 5.)

Personnel remains one of our most critical areas. As with most organizations in a time of traumatic change, Co-op experienced extensive managerial changes this past year. Colie Flaherty, manager of the Shattuck Avenue Center, assumed the additional responsibilities of food stores supervisor. Syd Hannigan, former buyer for Associated Cooperatives, took on the job of director of merchandising. After a six-month search, Nancy Snow was hired to fill the education director position. Howard Jessee, director of security and maintenance, took on the supervision of the Hardware/Variety Center. Rufus Chambers and Holly Brownscombe remain in their positions as controller and director of personnel respectively.

One of our biggest challenges back in April of 1984 was to create a climate of change and excitement in an organization which was stagnant and moribund and where creativity and risk-taking had been stifled. This is a long term process to which Co-op must commit itself and provide positive rewards and incentives. We have begun a program of participatory management at our University Avenue Center in order to bring more people into the decision-making process and to extend our problem-solving ability and to help improve the quality of decisions. Our Co-op-wide training program has also been expanded with supervisory training, produce staff training, cooperative customer relations training, etc.

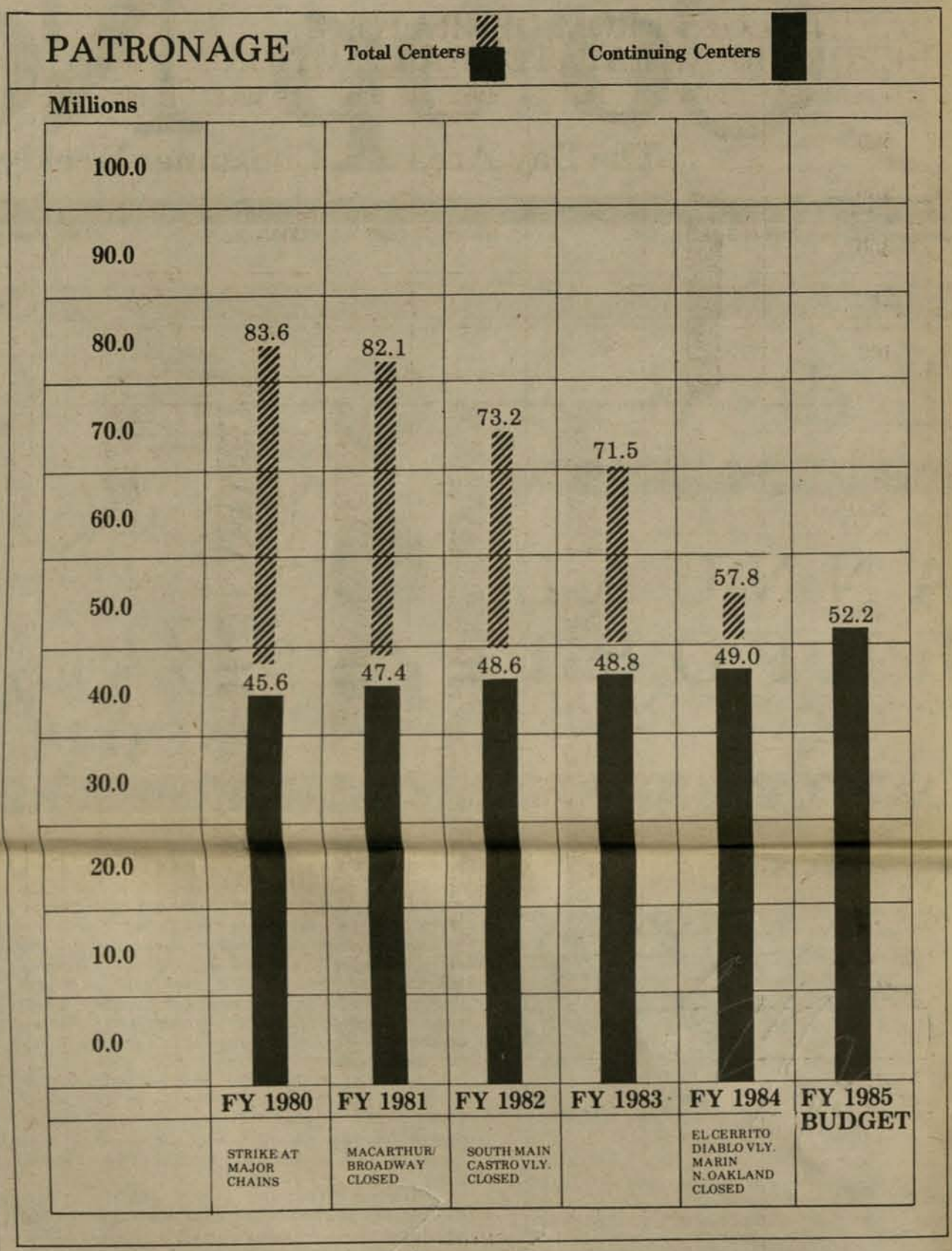
Given all this change, what does 1984 add up to for Co-op? Are the proposed remedies working? It is, quite frankly, too soon to say definitively. 1985 is a critical year. Every decision must be carefully evaluated for its potential financial impact both short and long term. We don't have room to be sloppy or to make mistakes. But some trends should give us cause for optimism. Sales at our remaining centers are up 10.7% from last year. The management staff is committed and highly enthusiastic. There is a sense of momentum building in the stores that will continue to grow as changes are made. We now have a plan that is moving us in a common direction and that identifies issues that need to be resolved.

1985 will not be an easy year. Although the immediate specter of financial insolvency no longer hangs over us, we must not relax or believe the work is done. 1985 is the year to be, literally, lean and mean in our operations. It is the year to build a common vision for our cooperative future. It is a year where members, board and staff must demonstrate their own personal capacities for cooperation so that the Consumers Cooperative of Berkeley can re-emerge as a successful example of democratic ownership and control.

Photo by Jane Scherr

Improving produce at the Co-op has been a major goal.

PATRONAGE



BOOK VALUE OF ONE $5 SHARE

1980	1981	1982	1982	1984	Budget 1985
5.09	3.51	2.46	.65	1.20	2.54
STRIKE AT MAJOR CHAINS		SOUTH MAIN, CASTRO VALLEY CLOSED		EL CERRITO, DIABLO VALLEY, MARIN, N. OAKLAND CLOSED	ASSUMED SALE OF EL CERRITO

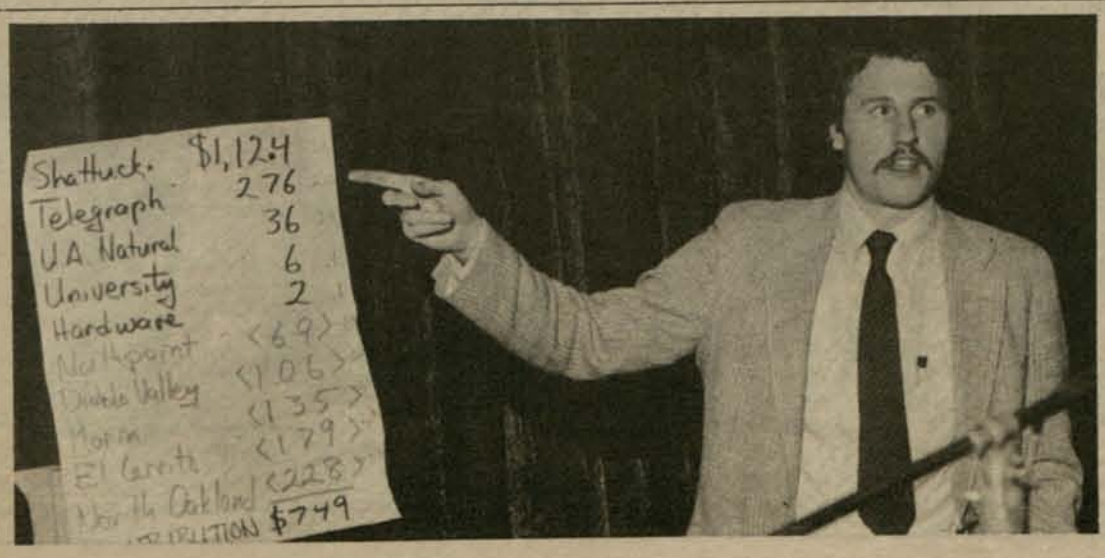
1984 ANNUAL REPORT

SAVING/LOSS FROM OPERATONS BEFORE REAL ESTATE TRANSACTIONS

Budget

(IN THOUSANDS)	1980	1981	1982	1983	1984	1985
500						
400	388					
300						
200						
100						
000						
-100						
-200						204
-300						
-400						
-500						
-600						
-700						
-800						
-900					943*	
-1000						
-1100		1,103	1,167			
-1200						
-1300						
-1400				1,423		
-1500						
	STRIKE AT MAJOR CHAINS	MACARTHUR/ BROADWAY CLOSED	SOUTH MAIN CASTRO VLY. CLOSED		EL CERRITO DIABLO VLY. MARIN N. OAKLAND CLOSED	

*This total includes $450,000 of losses and one-time closing expenditures in the four centers closed earlier this year.



CONTROLLER'S REPORT

The fiscal year ended September 29, 1984, saw Consumers Cooperative of Berkeley, Inc. report a net savings of $356,800, or 0.62% on patronage of $57,755,600. The actions taken by the Board of Directors and management during the fiscal year to restructure the Co-op, have resulted in a stronger organization. The audited financial statements, reported elsewhere, reveal an unqualified opinion and significant improvement in Co-op's financial condition.

Patronage of $57,755,600 for FY'84 is below the FY'83 patronage of $71,459,200, because of the closure of the Marin and North Oakland Co-op Center on January 28, 1984, Diablo Valley on February 4, 1984, and El Cerrito on April 14, 1984. The closed centers accounted for $8,721,000 in patronage during FY'84, and $22,596,000 in patronage during FY'83. As the accompanying graph illustrates, patronage in continuing centers has remained relatively stable for the past five years.

What the graph does not show is the patronage increase that several of our centers have experienced since the store closures. For example, since April 1984, the University Avenue Center has had a 4.4% patronage increase, Shattuck Avenue Center a 2.3% patronage increase, and Telegraph Avenue Center a 19.5% patronage increase over the previous year.

The Natural Foods Center was completely revamped by mid-October, 1984. Since the revamp, Natural Foods patronage has increased by 23.5% over the previous year.

The Northpoint Center and the Shattuck Avenue Hardware/Variety Center remain Co-op's biggest challenges. The Northpoint Center produce department has been revamped, with added produce variety, and the meat department is scheduled for a complete revamp along with the grocery department. The Shattuck Hardware/Variety was completely revamped, and converted to a Tru-Value Hardware during 1984. This was completed by mid-September. In addition, a new store manager was hired in November. Northpoint is beginning to show some improvement, while the Shattuck Hardware/Variety is still in the reorganization process. The management team feels these changes should result in a turnaround at these two centers.

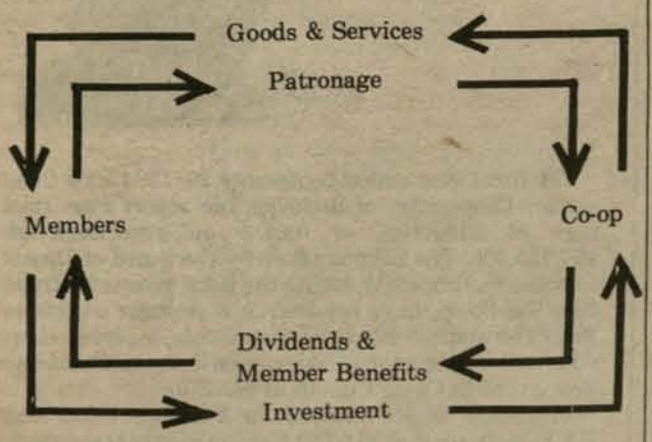
The net savings of $356,800 includes a gain on the sale of property (Marin) and the recognition of the deferred capital gain on the 1978 sale/leaseback of Diablo Valley. Excluding the gain on the sale of property, Co-op's operating loss of $943,400 for FY'84 compares favorably to the $1,423,800 operating loss for FY'83. The FY'84 operating loss isn't indicative of future results because it includes a substantial amount of one-time expenses related to the store closures, in addition to direct store losses for the period those centers were open. Direct store losses for the closed centers and store related close-down expenses amounted to approximately $450,000 in additional expenses. In addition, during FY'84 Co-op was assessed $93,000 in uncollected sales tax by the State Board of Equalization; and three centers performed below expected results. This is all behind Co-op now and we look toward a future that is certainly brighter.

The net savings of $356,800 has improved Co-op's balance sheet. Our membership shares are still impaired, but not to the degree of FY'83. A $5 membership share had a book value of $1.20 at the end of FY'84 as opposed to 65 cents at the end of FY'83. Co-op's working capital, while still negative, isn't as severely strained in FY'84 as in FY'83. Co-op's working capital shortage has been reduced by approximately $1,300,000 while the Long-Term Debt to Equity Ratio has improved. Our long-term debt exceeds equity by approximately 2.4 times. This is a significant improvement over FY'83 when our long-term debt exceeded equity by some seven times. While this improvement is impressive, Co-op is by no means out of the woods, or

1984 ANNUAL REPORT

to put it more graphically, Co-op is out of the intensive care unit but not out of the hospital. The current improvement will be further enhanced by the sale of the former El Cerrito Co-op Center.

While the board and management have acted to bring about a stronger Co-op, Co-op members must realize they play a vital role in the success of the business. I can graphically illustrate this by the accompanying diagram:



This diagram is presented to illustrate how your consumer dollars flow through the Co-op. Members, on the one hand, demand goods and services in exchange for their patronage dollars. On the other hand, members supply investment dollars in exchange for dividends and other member benefits. The cooperative supplies the goods and services to members in exchange for patronage dollars, and also supplies member benefits in exchange for member investment.

With this type of arrangement, both members and the cooperative have responsibilities. Members must support Co-op via member investment and patronage, while Co-op must provide cost efficient organization. The board has to implement policies which result in cost efficient operations, and management must carry out these policies. The appropriate rewards and sanctions must be imposed in the process. The actions taken by the board and carried out by management have enabled the Co-op to become stronger, or more cost efficient. The results of these actions are beginning to show increased patronage and, more importantly, a revitalization of the Co-op — a new sense of excitement.

Rufus Chambers, Jr.
Controller

PRESIDENT'S REPORT

In the past year and a half, your Board of Directors took the steps necessary to keep Co-op alive. We hired new management, closed and sold the stores that were losing the most money, and tried to set Co-op back on a road to financial health and consumer activism.

Our new management group is young, aggressive, imaginative and has strong background in cooperatives. They, and Co-op employees generally, have given tremendous effort to breathe new life into the organization, and members have responded by increasing purchases at Co-op.

Funds from the sale of stores have restored Co-op to a stable financial condition, but as of this writing we're still waiting to complete the sale of the former El Cerrito Co-op Center, which will provide the funds for long-delayed improvements in our remaining centers.

What we have done so far is to make it possible for Co-op to survive. To make this possibility a reality, most of the work remains. It will probably be about five years, for instance, before Co-op has made up its losses and is able to pay patronage refunds again. The coming year presents a full agenda for the board, including:

Growth: The closing of stores has left Co-op with a senior labor force, and thus a high hourly labor cost compared with other grocery stores. This is only partially offset by our employees' above average productivity. To lower our average hourly labor cost to near that of the competition, we need a substantial increase in volume, so that we can hire new employees. The most sure fire way to increase volume is to open new stores, but it was ill-advised expansion, followed by cutbacks, which got us in this fix in the first place. Whether, and if so how to grow, is an unresolved question.

New Store Format: Our stores are generally considered too small to compete, in price, with bigger stores like Safeway's. Yet we are determined to remain price competitive. We plan to solve this problem by changing the product mix to emphasize more perishables, natural foods, ethnic foods and "real variety" — that is variety of products which are actually different, not just different labels. The new Marin Marketplace, a joint venture in which Co-op is participating, will help us develop sources for pesticide-free produce. If they work, these merchandising innovations should result in stores which serve consumers better, and more efficiently, than any chain supermarket.

Member Participation: Many of the programs which have made Co-op special have come from members participating in the Co-op as volunteers. In the years of Co-op's financial crises, decisions have been centralized at the board level, and member participation has fallen off. To rebuild the Co-op we must rebuild the volunteer corps, to work on such projects as product testing, development of new services, and more. We must also reassess the role of center councils, which represent the members at each store.

Where Stores Have Closed: Thousands of Co-op members have been left without stores. Even if Co-op does decide to grow (see above), it's unlikely that we can serve most of these members in the near future. Members in each of the areas where stores have been closed have organized, or are trying to organize, independent local co-ops. But it's slow going for these groups on their own. What can we do to help?

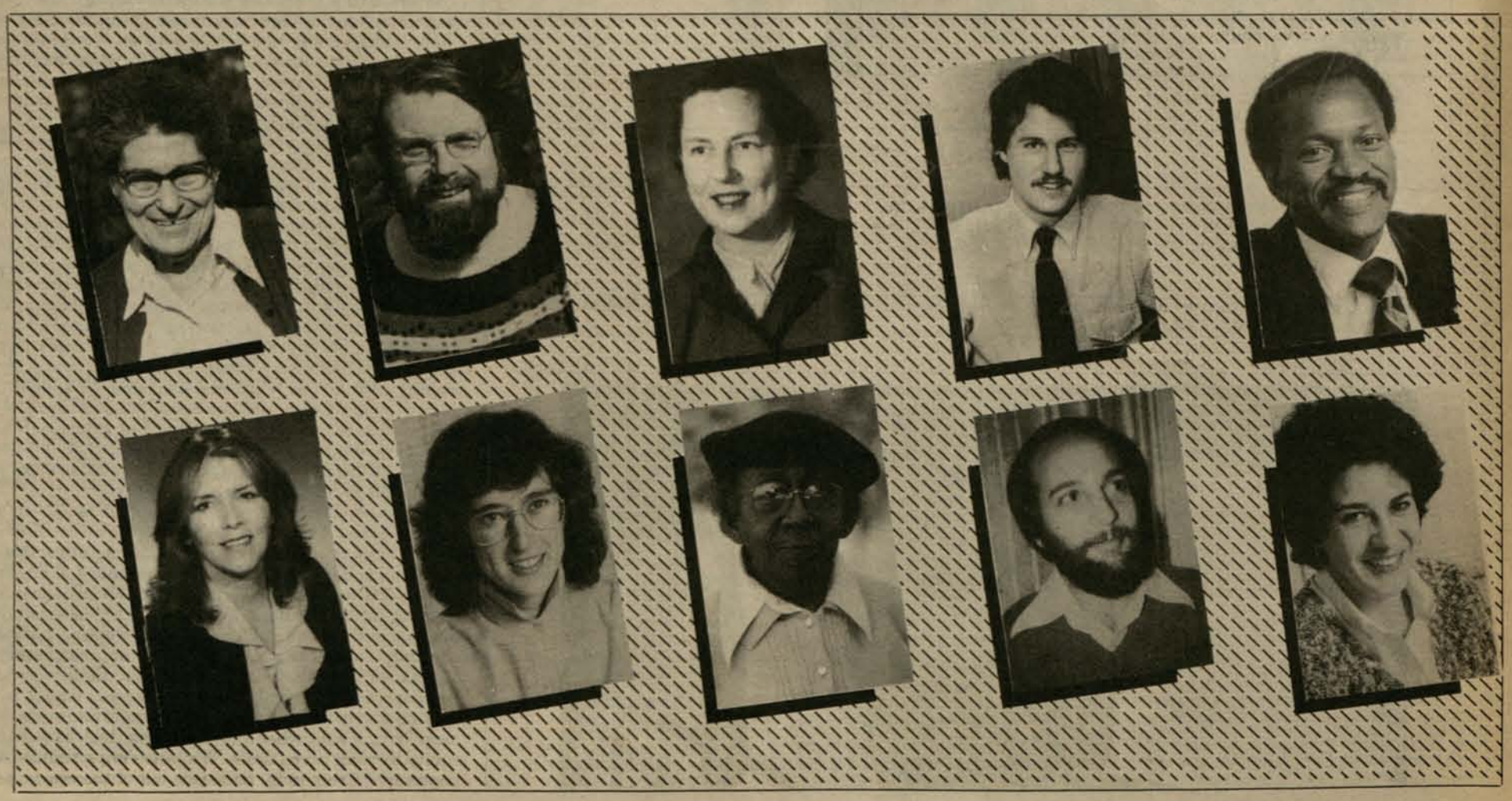
These are only a few of the major items on a long agenda. Clearly, board and management have their hands full.

Later this month, you will receive your ballot for the Co-op board election. There are four board seats vacant, and only four candidates on the ballot since only these four members filed. Although it may at first seem pointless to vote in such an election, I hope that you will take the time to read the candidates' statements, and vote for one or more. Serving on the Co-op board is not easy; whether or not an election is contested, it's important for those who are elected to know that there are members who support them.

I'll be leaving the board in February. It has been a privilege to serve Co-op as a director these past six years, and I am thankful to Co-op members for twice electing me. With the board and management who continue on, Co-op is in good hands.

Fred Guy
Co-op President

Co-op's Board of Directors, top from left: Florence McDonald, Bruce Miller, Margaret Gordon, Fred Guy, Brad Walters. Bottom from left: Kris Schoeller, A. Robin Orden, Erna Harris, Steve Schiller and Alice Gates. Not shown are Bob Boileau and David Kirkpatrick.



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EDUCATION DEPARTMENT REPORT

On a recent television program of the type devoted to end-of-the-year musings, several of our most well-known journalists traded insights regarding the future of this country. The theme was cooperation. They all agreed that what this country needs is not the proverbial five cent cigar, but a return to the values of cooperation and diligence.

It is just those qualities that we rely upon to make Co-op work. Out of the difficult decisions and hard work of this past year has emerged a new spirit in our Co-op — one of renewed dedication to the role we can and must play in our society. It is a tribute to the Board of Directors, staff, and members that we are beginning to regain the strength necessary to re-establish Co-op in its rightful place as a leader in our Bay Area community.

The Education Department has undergone a similar transformation. Many of the changes which Education staff has instituted at Co-op over the years are now standard practice in much of the grocery industry — unit pricing, consumer information, recipes, shelf labeling, etc. While we can quibble about the quality of the information offered or the purity of corporate motives, the fact remains that we are not so widely perceived as the leaders of a vigorous consumer movement as we were just a decade ago — the issues and the concerns have changed.

The challenge for the Education Department, then, has been to reevaluate existing programs, find out what our members need and want, what will attract shoppers and other potential new members to join Co-op, and — at the same time — reassert our place as consumer advocate in new and innovative ways. The work of this past year has begun those tasks.

It has been overall one of the most intense years of our history, and the Education Department has undergone a particularly significant change. At the beginning of Fiscal Year 1984, Lynn MacDonald became Co-op general manager, leaving the Education Department, which she had been directing. During the next eight months, Lisa Van Dusen, the half-time member services/marketing director performed herculean service by holding the entire department together while a search for a new education director went forward. I was hired to fill that position starting in July.

Research

A significant achievement of the department during that early period was a store-by-store market study, using a series of in-store interviews, which has helped establish a firm sense of just who our membership is. Understanding who our members and shoppers are, what they want, and what would attract current shoppers to become members forms the basis on which Co-op's long-range planning structure has been built.

The portrait of the typical Co-op member which emerged from our research has been particularly instructive. We now know that we need to reach out to a younger constituency. We have a solid base of loyal members, who have joined because they believe in the principles on which cooperatives operate. But we know, too, that we have a significant number of shoppers and potential Co-op members who do not understand what a cooperative is, how it functions, or even that there are real benefits to membership in a cooperative. We have an opportunity to bring that message to a wider constituency, and we have begun a variety of new projects to do just that.

Training

One of the best ways to reach out is through existing staff. When it was discovered that a significant number of our line staff were not sufficiently aware of cooperative principles to answers shoppers' questions, a joint education project was undertaken by the Personnel and Education Departments in cooperative customer relations.

Photo by Jane Scherr

Consumer information continues to flow to members through the Co-op News and in-store information. Members speak through the suggestion box.

That staff training has been almost completed now, and we look forward to adding an orientation for new members and potential members, which will begin in the next few weeks. This program will be run by outgoing Co-op News editor, Bob Schildgen, and will utilize a variety of other staff members as well.

Community Outreach

We've also involved ourselves in community activities that reflect our philosophy, as well as our outreach needs. In addition to continuing yearly participation in such events as the Bay to Breakers, and performances of the San Francisco Mime Troupe and the Pickle Family Circus, we have also been sponsors of the Nuclear Freeze Walkathon, World Food Day and the Food Bank, among others.

A cooperative, community service effort of the Education Department and Community Memory has been the installation of a computer bulletin board at our Telegraph Avenue store. The project has brought significant media attention and increased interest in the potential of public information-sharing projects. As those of you know who have waited in line to use the computer, this is a tremendously popular attraction, and we are now assisting Community Memory in evaluating the first months of the project. We look forward to finding new and exciting uses for such a service and invite member suggestions.

We've also begun using the Co-op News as an outreach medium, in an experiment to determine its appeal to a wider audience. With the new look of the News come new opportunities to bring to our members and potential members expanded coverage of consumer concerns as well as issues relevant to a cooperative agenda. This current test has reached an additional 20,000 households, and we are now evaluating the success of this experiment. In addition, we have also begun a series of ads on share investment and membership which feature Co-op members and which have appeared in a number of Bay Area newspapers. We think that our members are the best advertisement of what Co-op is.

Consumer Information

In addition, we have also expanded our use of consumer information. The home economist's Buyword is currently being heard on KDFC, and the response to these segments has been particularly encouraging.

The Northpoint Co-op Center was the scene of a new program of in-store demonstrations by noted nutritionist Stephanie Turner. This series was designed to reflect the concerns of our members for information on lower fat, lower salt cooking techniques that are also delicious and fun to prepare.

Co-op home economists Helen Black and Mary Gullberg have continued to organize resources in our tradition of consumer information and advocacy, as exemplified by our project on irradiated foods — a letter writing campaign undertaken to place pressure on the Federal Food and Drug Administration. Even with Mary Gullberg's retirement earlier this year, Helen has maintained our home economist programs, with assistance from Mary, now an occasional contributor to the News and continuing consumer activist.

A new program of monthly "bag lunch" forums was initiated, focusing on issues along the human food chain — from seed to table — that will bring consumer concerns together with environmental, health, land use, water, soil, and related issues. Co-op is joined in this endeavor by the Sierra Club Bay Area Chapter, Ecology Center, Pesticide Action Network and Friends of the River.

By bringing together groups that share these concerns, we hope to stimulate a cross-disciplinary examination of the growing crisis in the production and distribution of our food. We are daily besieged with reports of polluted ground water from pesticides, degradation of soils that are abused by wasteful agribusiness growing techniques, and increasing loss of small to medium farms to agribusiness.

Many of the activities and projects above are particularly relevant to our efforts to reinvolve members in Co-op activities and committees. Only through the active participation of members will we continue to expand and grow. We have developed a number of ways to further that goal — using our new member education program, attendance at our forums, as well as letters to new members, in-store contact, etc. to recruit members for committees and volunteer projects.

Changes

The past six months have been especially exciting for me, personally, as I have discovered what determination and excitement pervade the staff and Co-op activists. In particular, I want to acknowledge the many contributions of both Bob Schildgen and Lisa Van Dusen, two Education Department staff members who are leaving Co-op. Bob Schildgen, editor of the Co-op News for over six years, brought to it a sense of humor, wit, and telling analysis that are hallmarks of his tenure. I know I speak for all Co-op staff when I say that he will be sorely missed. His unflagging good humor has been a tonic during many trying times.

By the same token, Lisa Van Dusen's departure will leave us without her boundless enthusiasm, energy, and great competence. She will carry on her cooperative work as the now full-time director of the Palo Alto Cable Television Cooperative. It is with considerable regret that we see her leave — I personally don't know what I would have done without her during the past six months. Fortunately, both Bob and Lisa aren't really

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leaving — just transforming their commitment to the cooperative way.

Co-op in the Community

Most of us are aware of Co-op's unique place in the Bay Area community — both as a voice for the consumer and as a community institution. Just how extensive and continuing that role is can best be seen in the many ways we contribute to the general good. Generosity and support for issues in which we believe has been a continuing effort of our local center councils.

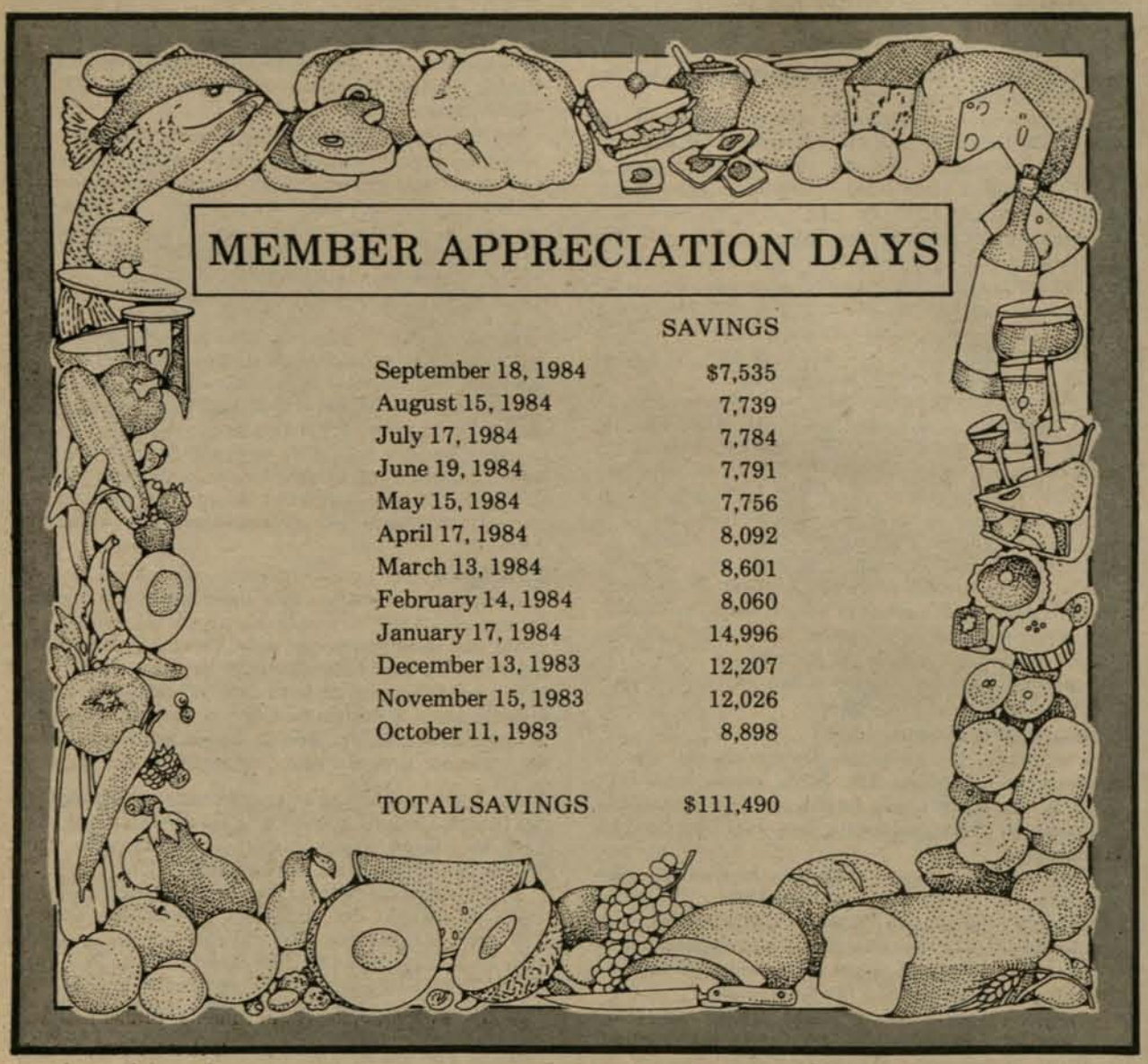
Using money raised by such events as annual flea markets, crafts sales, and other means, our center councils make donations to a variety of causes. For example, this past year, some of the recipients were organizations working on boycott issues, such as the Mission Foods Strike Committee and the Campbell's boycott, a number of public school projects, several camperships through Camps,Inc. (the Berkeley music camp), and Co-op Camp Sierra, issue oriented groups such as the Sierra Club campaign on Las Positas, Freeze Voter, Walk for the Seals, INFACT and community-based organizations, such as the Inter-tribal Friendship House, the YWCA, La Pena Cultural Center, AJOB and many more.

Beyond these gifts, of course, we continue to assist groups with special notice of events in the Co-op News, advertising on our shopping bags, announcements on store bulletin boards, and participation by our staff and members.

Active support of the community by our members is one of the most significant expressions of what makes us different — and points out, once again, how important that participation is to the health of the Co-op.

Photo by Jane Scherr

Community Memory was installed at the Telegraph Ave. Center



MEMBER APPRECIATION DAYS

	SAVINGS
September 18, 1984	$7,535
August 15, 1984	7,739
July 17, 1984	7,784
June 19, 1984	7,791
May 15, 1984	7,756
April 17, 1984	8,092
March 13, 1984	8,601
February 14, 1984	8,060
January 17, 1984	14,996
December 13, 1983	12,207
November 15, 1983	12,026
October 11, 1983	8,898
TOTAL SAVINGS	$111,490

I urge each of you to consider ways in which you can help the Co-op and the cooperative movement grow. The message of cooperation is urgently needed in a world that oftentimes seems intent on promoting selfishness and greed — both on a personal and a corporate level. Expanding that message — and strengthening the cooperative movement at the same time is a critical need, for the Consumers Cooperative of Berkeley and beyond.

The Future

As we approach our fiftieth anniversary, I think we have a unique opportunity to foster the growth of our own Co-op and to help bring other Co-ops into existence. We are the largest consumer cooperative in the nation — and cooperatives are the largest employers in one of the communities — Berkeley — we serve. We offer stable employment for hundreds of local residents and economic development that is a model of recycling resources in the local area.

Growth of the Co-op will take many forms this coming year, starting with the many changes in our existing stores which Lynn MacDonald details in her report — and all of these changes relate to our basic strategy to reposition ourselves within the marketplace. What this will mean to members is an expanded commitment to quality, health, and value. We will further develop health benefits for members, renovate and expand signage such as we now see in the cereals section, research and test new ways of reaching shoppers and members with consumer information, as exemplified currently with the video test at the Telegraph store, and work with members and staff to reach out to new groups in our community — both to develop new shoppers and find new ways to spread the message of cooperation.

These are part of the larger effort in Co-op to create a cooperative agenda. When I consider the successes of cooperatives such as the Mondragon example in Spain — and the very real successes that our own Co-op has enjoyed — it is clear that cooperatives can, if properly designed and managed, pose a real alternative. Success is dependent, however, on the infrastructure of the cooperative movement, and recent months have witnessed a renewed interest in creating such an infrastructure in our own communities. Creation of our forum series is one step to helping develop a cooperative agenda and there are other efforts beginning to create new worker cooperatives, identify areas for expansion for consumer cooperatives, and build the activist organizers to make those dreams a reality.

Finally, we plan to begin our Fiftieth Anniversary organizing this year — planning a grand celebration of our longevity. We will use this first year to create a festival, which we will continue annually, building to the anniversary celebration. With a sister co-op in Japan, crafts cooperatives throughout the country that we have worked with in the past, and a rich history of international and national cooperative associations, we have a wonderful opportunity to create a lot of fun and a renewed vision. Plese join us in reaching these goals.

Nancy Snow
Education Director

EDUCATION/ MEMBER SERVICES COMMITTEE REPORT

Early this year, the Co-op Board of Directors approved a recommendation from an ad hoc committee which redesigned Co-op's committee structure. The Member Services and Education Committees were combined, and Brad Walters was appointed convenor. The first meeting was held in mid-July.

Holdovers from the Member Services and Education Committees form the nucleus of this new committee, along with representatives from the center councils.

Nancy Snow, Co-op education director, and Educa-

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tion Department secretary Mary Hughes provide administrative support to the committee.

The activities of the committee reflect member interest in all aspects of Co-op services and operations.

The new committee recommended to the board that Co-op continue its membership in the Cooperative League, USA, California Consumer Federation, Consumer Federation of America, as well as the California Federation of Consumers and TURN (the consumer utility advocate in California).

The committee recommended that the board authorize the education director to develop a program for application of the funds in the Cooperative Education Fund and raise additional monies for this fund.

When the issue of public forum tables at the Co-op came up, the committee reviewed and recommended to the board that the Co-op continue its existing policy. The committee also recommended to the board that a glossary of co-op terms be made available for use in all Co-op centers, in order to provide members and the general public a better understanding of cooperatives.

The activities and interests of this committee guarantee productive and interesting sessions. Members interested in serving on this committee can call the Education Department at 526-0440. The committee meets on the third Thursday of every month at the Shattuck Avenue Co-op Center. You need not be a member of another committee or center council to participate.

Brad Walters, Chair
Education & Member Services Committee

FINANCE/ MANAGEMENT COMMITTEE REPORT

1984 was a major turning point for Co-op. Painful decisions were made to close half our supermarkets to stop escalating financial losses and to redirect our resources to make the remaining operations first rate. The audit report vindicates these actions by reflecting a "clean" opinion. In contrast to recent years, our independent auditors have rendered their report with no reservation about Co-op continuing as a going concern.

Looking back over the year, many things have been accomplished in the Finance, Management, & Planning areas. Perhaps the most significant achievement was the preparation by management of a meaningful, formal business plan for 1984, and a five year plan starting with 1985.

With these acts, Co-op has moved from a reactionary, "crisis management" mode, to a thoughtful, positive "planning" mode. A commitment to continue this planning process each year has ensured our ability to direct our destiny, rather than being cast about by the whims of the market and the moment.

With each repetition of the planning cycle, improvements in the process are being made. The first, one year plan has been made a five year plan in the second cycle. In a fashion unprecedented in Co-op, all levels of management have been involved in plan development. Successive planning cycles will reach further, involving other sectors of the organization, until our planning process is fully participatory.

Looking ahead, much work for the committee remains for 1985:

1) Continuation of development of the business analysis group which charts business trends and communicates results to each store via a Center Council representative.

2) Continuation of seeking stable and creative means for meeting Co-op's capital needs. Development of checkstand share purchase capability on the cash registers is a top priority.

3) Completing the restructuring of Co-op by identifying and offering services to Co-op members no longer directly served by supermarkets.

4) Pursuing future plans for diversification of Co-op services to more fully meet the needs of members and to provide a business base more stable in the long term.

Any report of the committee's work must commend the excellent, dedicated job being done by Co-op's Controller, Rufus C. Chambers, Jr. Thanks are also due Margaret Gordon for serving as committee secretary last year.

Bruce Miller, Chair
Finance/Management Committee

CONSUMER PROTECTION COMMITTEE REPORT

The Merchandising and Consumer Protection Committee has had a spotty record this year. Our committee has become smaller instead of larger despite the fact that there are so many issues in which we should be involved.

We were very happy that our campaign in support of the boycott of Nestle's products proved to have an impact. And we did take action around the boycott of Campbell's products because of that company's poor labor policies. But basically our activities can only be meaningful if we have strong support from each Co-op center.

We wish to thank the Co-op News for being very supportive of our efforts.

Florence McDonald, Secretary
Merchandising and Consumer Protection Committee

ELECTION COMMITTEE REPORT

I want to start this report on the work of the Election Committee by urging you to vote for members of the Board of Directors and for members of your local center council. (Ballots will be mailed and voting runs from January 21 to February 3.) If you want to affect the Co-op, two of the most important ways to do so are voting and taking an active part in your local center council.

The primary work of the Election Committee took place last January and February and we will do it once again this January and February. That work is to run the elections for board and center council members. The election rules and the manual for the election have developed over the years and we modify or change them only to make Co-op elections even fairer and more democratic. The Election Committee sets the schedule for the election subject to the approval of the Board of Directors.

After the close of voting it is the committee's duty to count the ballots, which is a somewhat long and involved process. We are always thankful for those who volunteer to help. If you can help in counting ballots at any time from February 2 to 15, please let us know (call Fred Converse at 524-7727 or Henry Lynn at 540-8419).

The committee also works with the Education Department in planning and running Co-op's Annual Membership Meeting scheduled for January 25. We hope you will attend and persuade others to do so as well.

There is a loyal group of people who have worked on the Election Committee over the years and have made it the fair and efficient body it is.

Claude Grady who died recently at the age of 90 was a faithful committee member who served for many years including the election of 1984. In fact we had hoped to see him again this year.

Leonard McKay was committee chair for many years and without his continued presence I don't know how the committee would operate. John Hopkins, who has also served on the committee for a long time, is certainly a person that we cannot do without.

Fred and Emily Converse are extremely important members of the committee. They wrote and carried out the computer program for ballot counting in last year's election and will be running the program for this year's election as well. The Co-op owes them a great deal.

Frank Hess and Roy Winnie are faithful, active members of the committee who deserve many thanks.

Ardith Kenney who is co-chair of the Election Committee is also involved in writing the program for the counting of ballots.

Again I urge you to vote. The number of members who vote in the board election is far too small. The number of Co-op members who vote for center council members is minute and shows a very unfortunate lack of interest in the Co-op. If you have any interest at all in the Co-op, if you want to affect it in any way, vote, attend meetings, speak up, let me and others including management and the board hear from you.

Henry Lynn
Chair, Election Committee

TRAVEL COMMITTEE REPORT

CO OP TRAVEL

For the year 1984 the Co-op Travel Committee is very happy to announce that over 1600 Co-op members, employees and their families have travelled to over 14 countries on three continents and have saved themselves over $55,000. What makes this particularly significant is that all of this was accomplished at no cost to Co-op as the travel agency's expenses were all defrayed by Char-Tours Inc. of San Francisco in its capacity as owner and manager.

The major savings for our members came from discounts on European charter flights, bulk fares on World Airways scheduled services between the west coast and Newark, New Jersey; Baltimore, Maryland; London, England; and Frankfurt, Germany. While no new services were offered this year, the rates on the standard services dropped considerably during the latter part of the year.

The Travel Committee in cooperation with Char-Tours is well under way in planning for 1985. The upcoming programs include the traditional charter programs to Amsterdam via Martinair, the charter affiliate of KLM Royal Dutch Airlines, and to Zurich via Balair, the charter affiliate of Swissair, the national airline of Switzerland. You are urged to watch our ads in the Co-op News for possible new European destinations in 1985. We shall continue to offer Eurailpasses and Britrail Passes at a discount to Co-op Members, employees and their families. In response to demands by members we have blocked space on the 14-day Alaska Cruise via the S.S. Universe which will depart from Vancouver on June 16th. This year we are able to offer this cruise during school vacation time so that families with children can take advantage of our special fares.

A special tour for Co-op members and their families is also being planned for the Spring of 1985 (March 11 to March 28) to Spain and Morroco which includes visits to Madrid, Bailen, Cordoba, Seville, the Costa del Sol, Malaga, and Granada in Spain and Ceuta, Fez, Marrakech, Casablanca, Mohamedia, Rabat and Tangier in Morroco.

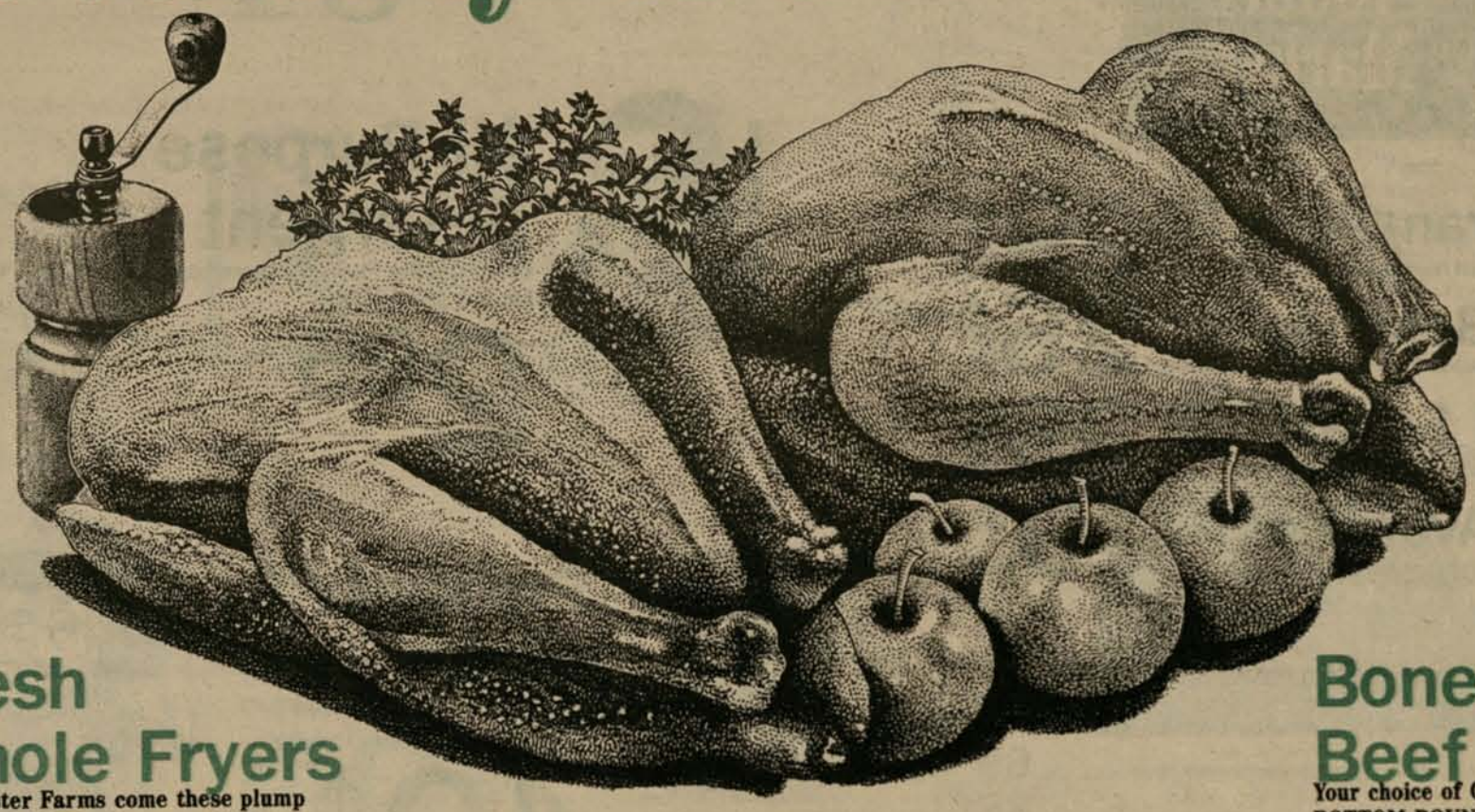
The Travel Committee is both anxious and willing to add to its numbers, so if you would like to get involved in the world of travel all you have to do is show up at the monthly meeting which is held on the second Thursday of each month at 7:30 p.m. in the meeting room of the Shattuck Avenue Co-op Center, 1550 Shattuck Ave., Berkeley. It might be wise to call ahead to Alan Robb, the travel coordinator, at 549-1884 as the meetings are occasionally changed to accommodate members with previous commitments. Please join us.

Robert Ford, Chair
Travel Committee

YOU DON'T HAVE TO BE A MEMBER TO SHOP — SPECIALS GOOD MON. THRU SUN., JAN. 7-13, 1985 — CONSUMER OWNED SINCE 1937

co-op

A Variety of Meat Ideas...



Fresh Whole Fryers
From Foster Farms come these plump and tender California grown birds.

69¢ lb.

Shoulder Lamb Chops
Well trimmed Blade Cut meaty chops

2.29 lb.

Smoked Picnics
Water added whole pork picnics

1.09 lb.

Armour Hot Dogs
Meat or Beef Hot Dogs

1.69 lb.

Boneless Beef Roasts
Your choice of CROSS, RIB, RUMP, BOTTOM ROUND or SIRLOIN TIP cuts at one price.

1.99 lb.

Boneless Leg of Veal
Delicious veal roast. 3 to 5 lbs.

2.49 lb.

Boneless Veal Stew
Lean and tender veal cubes

2.19 lb.

Oscar Mayer Bologna	Meat or Beef	lb.	1.69
Oscar Mayer Salami	Meat or Beef, 12 oz	ea.	1.59
Louis Rich Variety Pack	12 oz. pkg	ea.	1.89
Louis Rich Turkey Breast	Smoked Fully Cooked	lb.	3.49
Barbecued Turkey Breast	Louis Rich Fully Cooked	lb.	3.49
Turkey Breast	Oven Roasted, Louis Rich Fully Cooked	lb.	3.49

Breast of Veal	Ideal for stuffing	lb.	1.29
Veal Shanks	Meaty cuts for Osso Bucco	lb.	1.49
Veal Scallopini	Thin slices	lb.	4.49
Breast of Lamb	Another cut to stuff	lb.	.89
Lamb Chops	Round Bone, Shoulder cuts	lb.	2.49
Eye of Round Roast	Well trimmed beef	lb.	2.79
Sirloin Tip Roast	Well trimmed beef	lb.	1.99
Co-op Sliced Bacon	Regular or Thick	lb.	1.69

UNIVERSITY BERKELEY
1414 UNIVERSITY AVE. (AT ACTON)
MON.-FRI. 9-9, SAT. 9-8, SUN 10-7
848-6002—FREE PARKING

SHATTUCK BERKELEY
1550 SHATTUCK AVE. (AT CEDAR)
MON.-SAT. 8-11, SUN. 9-10-843-6740
FREE PARKING

TELEGRAPH BERKELEY
3000 TELEGRAPH AVE. (AT ASHBY)
MON.-SAT. 9-11, SUN. 9-10-843-3804
FREE PARKING

NATURAL FOODS
1581 UNIVERSITY AVE.-548-6612
MON.-SAT. 9-7, SUNDAYS 10-6
FREE PARKING

SAN FRANCISCO
NORTHPOINT MALL (BAY & MASON)
MON.-SAT. 9-9, SUN. 9-8-391-3075
VALIDATED PARKING

HARDWARE-VARIETY
1601 SHATTUCK AVE. (AT CEDAR)
MON.-FRI. 9-6:30, SAT. 8:30-6:30,
SUN.. 10-6—548-1122

Managers Call the Specials

Produce Market

Navel Oranges — Fancy sweet and juicy fruit from San Joaquin Valley..... 29¢ lb.

Golden Bananas — Everyone's favorite lunch box fruit from Cen. America..... 25¢ lb.

Zucchini Squash — Tender tasty Italian squash from Mexico..... 39¢ lb.

Zutano Avocados — Medium size from Fallbrook for salads..... 19¢ ea.

Yellow Onions All purpose onion from Oregon..... lb. 19¢

Loose Carrots Tender vegetable from Bakersfield area..... lb. 25¢

Grapes Emperor, juicy dark grapes from San Joaquin Valley..... lb. 69¢

Papayas Hawaiian, med. size tropical fruit. Great for breakfast. ea. 88¢

Eggplants Medium, glossy firm eggplants from Mexico..... ea. 59¢

Potatoes Russet U.S. No. 1 baking potatoes from Oregon..... lb. 29¢

Tangelos Minneola, easy to peel & fun to eat. From San Joaquin. lb. 59¢

Co-op Non-Fat Milk — Quality Pack Dry Milk, 32 ounce, regular 4.19..... 3.69

Co-op Pitted Olives — Quality Pack, Extra Large, 6 ounce, reg. 1.28..... 1.08

Cucumber Chips — Co-op Quality Pack, 22 ounce jar, regular 1.35..... 1.09

Seafood Shop

Fresh Scallops — Tasty Eastern scallops to pan fry or broil..... 3.49 lb.

Fresh Idaho Trout — Average size 10 to 22 ounces. To pan fry..... 1.79 lb.

Fresh Dover Sole Weather permitting..... lb. 2.69

Fresh Sea Bass Fillets Weather permitting. lb. 4.69

Fresh Icelandic Cod Weather permitting..... lb. 2.98


Colie Flaherty, Shattuck

All Purpose Detergent
Co-op Quality Pack, 84 ounce box, regular price 3.29
2.95


Chris Robinson, Natural Foods

Puffed Cereal
Alf Puffed Rice, Millet, Corn or Wheat, 6 ounce, reg. 77¢ & 64¢
49¢


Jim Mazzini, Telegraph

Co-op Chile w/Beans
Quality Pack Regular or Hot, 15 ounce, regular 89¢
75¢

Frozen Grape Juice
Seneca Brand Natural, 12 ounce, reg. 1.25
85¢


Karl Kruger, Northpoint

Wild Mt. Honey
5 Pound Size, reg. 5.59
3.99


Mel Holmes, University

Riviera Minestrone
Or Italian Tomato Soup, 20 oz., reg. 95¢
69¢

Heinz Keg 'O Ketchup
32 ounce size, regular 1.79
1.39

Zee Paper Towels
99 Count, regular 79¢
55¢

C&W Frozen Whole Baby Carrots 10 oz., reg. 1.16..... 85¢

C&W Frozen Petite Peas 16 ounce, reg. 1.49..... 1.19

C&W Frozen Blueberries 12 oz., reg. 2.45..... 1.89

Today's Catch Cod Fillets Van de Kamp Frozen, 12 oz., reg. 3.09..... 2.59

Today's Catch Sole Fillets Van de Kamp Frozen, 12 oz., reg. 3.45..... 2.85

Today's Catch Fish Fillets Van de Kamp Frozen, 12 oz., reg. 2.79..... 2.29

Today's Catch Flounder Fillets Van de Kamp Frozen, 12 oz., reg. 3.45 2.85

Today's Catch Perch Fillets Van de kamp Frozen, 12 oz., reg. 2.99..... 2.49

Wesson Oil 48 ounce size, regular 3.69..... 2.95

Purina Dog Food Hi Pro, 50 lb. Size, reg. 19.19..... 17.55

Ajax Liquid Detergent For dishes, 32 oz., reg. 2.25 1.69

Kleenex Facial Tissue 175 count, reg. 99¢..... 85¢

Bisquick Baking Mix 40 ounce, regular 1.74..... 1.69

Tell the Manager What You Like

If there's anything that makes a Co-op 'work' it's having steady input from shoppers. It's especially helpful when you tell us what you like but we accept compliments, too. Most people know about putting a note in the Suggestion Box, available in each Co-op Center. But you can give your comment directly to the Center Manager, too. If you don't know the Manager in your Center, find his picture on this page. We've put it right by the grocery item he chose for this week's ad.

Wine & Spirits Shop

Taylor 1.5L Wines — Burgundy, Chablis or Rhine Wine (Case . . . 17.70) Regular 3.99..... 2.99

Fetzer Fume Blanc — 750 ml Bottle (Case . . . 60.37) regular 6.35..... 5.59

Cabernet Sauvignon — Fetzer, 750 ml Bottle (Case . . . 60.37) regular 6.35..... 5.59

Dairy Mart

Low Fat Milk — Valley Gold, Half Gallon, regular 95¢..... 87¢

Valley Gold Yogurt — Various Flavors, 8 ounce, regular 39¢..... 29¢

Ice Cream — Valley Gold, Half Gallon, regular 2.19..... 1.59

Orange Juice — Tropicana, Half Gallon, regular 2.27..... 1.75

Swiss Cheese — Co-op Quality Pack, random weight packages..... 50¢ Off Pkg.

Coffee Beans — Co-op Special Blend, 1 lb. bag, regular 4.35..... 3.39

6 Pack Coca Cola — All Varieties, 6/12 oz. cans, regular 2.39..... 1.69

1984 ANNUAL REPORT

CONSUMER'S COOPERATIVE OF BERKELEY, INC.

Financial Statements for the Fifty-Two Week Periods Ended September 29, 1984 and October 1, 1983 and Auditors' Opinion

STATEMENTS OF FINANCIAL POSITION

OUR ASSETS CONSISTED OF:	SEPTEMBER 29, 1984		OCTOBER 1, 1983	
Assets to be used within one year:				
Cash	$ 36,200		$ 160,700	
Merchandise	1,993,200		3,233,300	
Amounts due from businesses and customers	405,200		250,500	
Prepaid expenses and other current assets	237,000		359,000	
Property held for sale	621,000			
Current assets were		$3,292,600		$ 4,003,500
Property		3,644,900		5,887,000
Investment in our principal supplier, Associated Cooperatives, Inc		1,334,000		1,696,900
Other assets		325,500		359,200
Our assets totaled		8,597,000		11,946,600
WE DETERMINED MEMBER EQUITY BY DEDUCTING:				
Obligations due within one year:				
Associated Cooperatives, Inc	1,262,100		1,789,000	
Other suppliers and operating expenses	2,700,600		4,305,700	
Current portion of long-term debt	1,180,500		1,080,200	
Current obligations were	5,143,200		7,174,900	
Long-term debt	2,442,500		3,796,100	
Deferred gain on property sale/leaseback			406,200	
Our obligations totaled		7,585,700		11,377,200
LEAVING MEMBER EQUITY		$1,011,300		$ 569,400
MEMBER EQUITY INCLUDED:				
Shares - $5.00 stated value		$4,071,300		$ 3,986,200
Accumulated deficit		(3,060,000)		(3,416,800)
MEMBER EQUITY AS ABOVE		$1,011,300		$ 569,400

See significant accounting policies and other financial information.

STATEMENTS OF OPERATIONS

	52 WEEKS ENDED SEPTEMBER 29, 1984		OCTOBER 1, 1983	
OUR PATRONAGE	$57,755,600	100.00%	$71,459,200	100.00%
OUR WHOLESALE COST OF MERCHANDISE SOLD	42,847,400	74.18	53,611,200	75.02
THE DIFFERENCE WAS OUR GROSS MARGIN	14,908,200	25.82	17,848,000	24.98
OUR OPERATING EXPENSES CONSISTED OF:				
Operating and administrative	15,460,800	26.77	18,841,400	26.37
Interest expense - net of interest income of $11,000 in 1984 and $39,000 in 1983	390,800	.68	430,400	.60
TOTAL OPERATING EXPENSES	15,851,600	27.45	19,271,800	26.97
OUR LOSS FROM OPERATIONS	(943,400)	(1.63)	(1,423,800)	(1.99)
GAIN ON SALE OF PROPERTY	1,300,200	2.25		
NET SAVINGS (LOSS)	$ 356,800	.62%	$(1,423,800)	(1.99)%

See significant accounting policies and other financial information.

CHANGES IN FINANCIAL POSITION

	52 WEEKS ENDED SEPTEMBER 29, 1984	OCTOBER 1, 1983
OPERATIONS:		
Loss from operations	$ (943,400)	$(1,423,800)
Depreciation, an expense which does not use cash	572,000	672,200
Working capital used by operations	(371,400)	(751,600)
Cash provided (used) by changes in:		
Merchandise	1,240,100	323,300
Amounts due our suppliers and others	(2,132,000)	494,200
Amounts due from businesses and customers	(154,700)	(39,300)
Other - net	155,700	(5,200)
Cash provided (used) by operations	(1,262,300)	21,400
FINANCING ACTIVITIES:		
Member shares sold	85,100	97,400
Member certificates of interest issued	110,900	286,400
Repayments/redemptions:		
Member certificates of interest	(531,100)	(411,500)
Capital leases, mortgages, and other notes	(833,100)	(290,800)
Cash (used) by financing activities	(1,168,200)	(318,500)
INVESTMENT ACTIVITIES:		
Proceeds from property dispositions	2,270,400	
Reduction of investment in Associated Cooperatives	362,900	
Property additions	(327,300)	(63,700)
Cash provided (used) by investment activities	2,306,000	(63,700)
OUR CASH DECREASED BY	$ (124,500)	$ (360,800)

See significant accounting policies and other financial information.

SIGNIFICANT ACCOUNTING POLICIES AND OTHER FINANCIAL INFORMATION

ORGANIZATION

We operate retail grocery stores and related facilities in the San Francisco Bay Area. Sales are made to both members and nonmembers.

STORE CLOSURES

As a result of our continued losses from operations in recent years, negative working capital and high level of debt relative to our equity, we closed the Marin, North Oakland, Diablo Valley, Castro Valley Wilderness and El Cerrito stores in 1984. The patronage of these centers was as follows:

Date of Closure	CLOSED CENTERS	1984	1983
January	Marin	$2,244,700	$ 5,446,400
January	North Oakland	1,476,000	5,277,300
February	Diablo Valley (Geary Road)	1,770,400	5,353,800
April	Castro Valley Wilderness	249,000	429,500
April	El Cerrito	2,980,900	6,089,900
	Total	$8,721,000	$22,596,900

We owned two of these Centers, Marin and El Cerrito.

We sold the Marin Center for $2,300,000 resulting in a gain of $1,349,000. We sold our lease on the Diablo Valley Center and consequently recognized $423,000 of deferred gain remaining from our 1978 sale/leaseback of that Center. Disposal of equipment and other costs associated with closing the five stores resulted in a net loss of $471,800.

We have a preliminary agreement to sell the El Cerrito Center for approximately $2,000,000. Assets related to the Center are classified as property held for sale and the related mortgage on the Center of $512,200 is classified in current portion of long-term debt at September 29, 1984. Under the pre- liminary agreement, we would remain liable for the mortgage which would become due when the El Cerrito Center is sold.

MERCHANDISE

Our merchandise is stated at the lower of average cost or market. Average cost is principally determined using inventory methods based on current retail prices and average gross margins.

PROPERTY

Our buildings, equipment, and other property are carried at cost. Depreciation is computed using the straight-line method based on the estimated useful lives of the properties (principally fifteen to thirty years for buildings and improvements and three to fifteen years for equipment and fixtures). Property consisted of:

	1984	1983
Land	$ 830,900	$ 1,363,800
Buildings and improvements	3,558,000	7,332,300
Equipment and fixtures	3,568,300	4,010,400
Total cost of property	7,957,200	12,706,500
Less accumulated depreciation	4,312,300	6,819,500
Property less accumulated depreciation	$3,664,900	$ 5,887,000

LEASES

A capital lease is one as to which we have assumed most of the risks and benefits of ownership. Assets held under capital leases are included in property as follows:

	1984	1983
Buildings and improvements	$577,900	$1,064,400
Equipment and fixtures	$320,000	$ 537,200
Accumulated depreciation	$548,500	$ 822,800

Our minimum rental commitments at September 29, 1984 for operating leases were:

1985	$ 159,000
1986	136,000
1987	113,200
1988	103,300
1989	90,400
Thereafter	546,700
Total	$1,148,600

In addition, certain of these leases require contingent rentals based upon increases in the consumer price index or sales levels at the centers. Net rental expense was $192,700 in 1984 and $195,000 in 1983, including contingent rentals of $180,500 in 1984 and $195,500 in 1983 and sublease income of $170,000 in 1984 and $241,000 in 1983.

ASSOCIATED COOPERATIVES, INC.

Our share of the equity of Associated Cooperatives, Inc. (AC), our principal supplier, approximates our cost. We and AC's other major patrons purchase merchandise on a cost-plus basis. Merchandise purchases from AC totaled approximately $20,390,000 during 1984 and $31,000,000 during 1983, including charges for our share of AC's costs. Financial information of AC at October 27, 1984 and October 29, 1983 and for its fiscal years then ended is summarized as follows:

	1984 (Unaudited)	1983
Assets	$ 7,179,000	$ 7,389,000
Obligations	5,041,000	5,323,000
Equity	$ 2,138,000	$ 2,066,000
Working capital	$ 3,594,000	$ 1,803,000
Patronage	$35,676,000	$47,253,000
Net savings	$ 144,000	$ 144,000

DEBT

Debt at September 29, 1984 and October 1, 1983 consisted of the following:

	1984 Long-Term	1984 Current	1983 Long-Term	1983 Current
Member certificates of interest	$1,182,700	$ 425,700	$1,250,600	$ 778,000
Mortgage and other notes	861,400	714,900	1,714,700	176,300
Capital leases	398,400	39,900	830,800	125,900
Total	$2,442,500	$1,180,500	$3,796,100	$1,080,200

Our members were paid interest of $209,900 during 1984 and $205,600 during 1983 at rates ranging from 4-1/2% to 14% on certificates of interest. Mortgage and other notes payable bear interest ranging from 8-1/2% to 13%. Obligations under capital leases represent minimum lease payments discounted at rates of 8% to 14%. At September 29, 1984 our scheduled repayments of debt, including imputed interest on capital leases, were as follows:

	Member Certificates of Interest	Mortgages and Other Notes	Capital Leases
Repayments during fiscal year:			
1985	$ 425,700	$ 714,900	$ 75,000
1986	299,900	229,000	53,700
1987	464,500	258,300	53,700
1988	66,100	159,900	53,700
1989	177,300	40,200	53,700
Thereafter	174,900	174,000	669,400
Total	$1,608,400	$1,576,300	959,200
Less imputed interest included in our minimum commitments			520,900
Present value of minimum commitments			$438,300

Assets of the El Cerrito Center classified as property held for sale and other property with a carrying value of approximately $2,300,000 at September 29, 1984 are collateral for the mortgage notes.

MEMBERSHIP SHARES

The Board has suspended redemption of membership shares indefinitely. This suspension has been in effect since July 27, 1981.

INCOME TAXES

We have not provided for income taxes in 1984 because the $423,000 deferred gain recognized this year on the sale of the Diablo Valley Center had been included in taxable income in 1978. As a result of losses incurred in recent years we have operating loss carryforwards of approximately $2,960,000 which can be used to reduce Federal taxable income in years through 1998.

PENSION PLAN

We participate in industry-wide employer-union pension plans which cover our full-time employees. Based on the most recent actuarial evaluation, our share of the unfunded vested benefits of these plans approximated $3,000,000. Our expense under these plans was approximately $666,000 in 1984 and $820,800 in 1983.

SUBSEQUENT COMMITMENT

In December 1984 we agreed to lease a portion of the Marin Center for fifteen years with an option for another five years. Our commitment is contingent upon the sale of the El Cerrito Center and would commence no earlier than April 1985. Minimum rental for the first ten years is $120,000 per year.

AUDITOR'S OPINION

Consumers Cooperative of Berkeley, Inc.:

We have examined the statements of financial position of Consumers Cooperative of Berkeley, Inc. as of September 29, 1984 and October 1, 1983 and the related statements of operations and changes in financial position for the fifty-two week periods then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying financial statements present fairly the financial position of the Cooperative at September 29, 1984 and October 1, 1983 and the results of its operations and the changes in its financial position for the fifty-two week periods then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Deloitte Haskins & Sells

Deloitte Haskins & Sells, Oakland, California, November 30, 1984 (December 21, 1984 as to "Subsequent Commitment" discussed in the financial statements)

co-op

Natural Foods

Pomegranate Juice
Heinke, 32 oz., reg. 1.98

1.68

Fantastic Couscous
Try it! 14 oz. package, reg. 1.29

79¢

Natural Foods specials at all Co-op Food Stores and University Natural Foods Center.

Heinke Pear Juice
32 Ounce Bottle, reg. 1.89

1.39

ANYONE may shop at Co-op, so —

Why join it?

BECAUSE members get a number of benefits including

- 5% discounts every month
- $2 to $4 worth of discount coupons each week
- Check cashing privileges of $25 to $100 cash over amount of purchase
- Credit union eligibility: the right to join a locally-owned credit union for savings, loans and other financial services
- Co-op News mailed to you each week

PLUS, in joining Co-op you become part of a community-owned business and consumer organization with over 100,000 members. We represent consumers at the local, state and national level, speaking up for better food policy, honest labeling, and a more environmentally sound food system. We believe in food for people, not for profit — but if there are net earnings at the end of a year, these are refunded to members based on the amount purchased.

If you'd like to join Co-op, pick up an application form in the store. If you'd like more information about Co-op, talk to the manager at your favorite Co-op center or call the Education Department at 526-0440.

- **Long Grain Brown Rice** regular 49¢ ..... lb. **39¢**
- **Black Turtle Beans** regular 61¢ ..... lb. **49¢**
- **Wheat Bran** regular 33¢ ..... lb. **25¢**
- **Oat Bran** Buy just what you need, regular 1.05 ..... lb. **85¢**
- **Peanut Butter Stock** regular 1.38 ..... lb. **1.09**

6 Pack Spree Natural Sodas
Cola, Root Beer, Grapefruit, Mandarin Lime, Lemon Lime or Ginger Ale, 6/12 oz. cans, reg. 2.49

1.79

Lift Cleaner
Biodegradable, 32 oz., reg. 3.35

2.45

Jo Joba Farms Shampoo
8 ounce size. A good value this week. Regular 3.17

2.29

(Condition reg. 3.47. 2.69)

Health & Beauty Aids

Barbasol Aerosol Shaving Cream
Reg., Lime, Menthol or Condition, 11 oz., reg. 1.22

95¢

Pacquin's Hand Cream
4 ounce jar, our regular price 2.35

1.47

Co-op Dental Floss
Waxed or Unwaxed, 200 yds., reg. 1.89

1.19

Buyword

Alcohol in Mouthwashes & Cold Medicines

By Guest Home Economist Mary Gullberg

If you take medicine in a liquid form, with each dose you will get the active ingredient which is intended to cure or relieve your symptoms plus several inactive ones such as coloring, flavoring and very likely some alcohol (see chart). What's the alcohol doing in medicines? It's in hundreds of liquid preparations, both prescription and over-the-counter (OTC) drugs. These are mostly cough and cold medicines which may be taken by all members of the family.

Alcohol is used in drugs because it is an excellent solvent, better than water for keeping some ingredients in solution. FDA requires that its percentage be stated on the labels of OTC drugs. Its percentage in prescription drugs is available in the professional labeling (information for doctors, pharmacists and other health personnel) or it will be on the label if the bottle the pharmacists stock can be dispensed in its entirety. Or it may be found in books such as *Physicians' Desk Reference*. If you are concerned about the amount of alcohol in your prescription, ask your pharmacist or your doctor to look it up for you.

Two kinds of alcohol are used in drugs: ethyl (found in beers, wines and liquors) and isopropyl which must NOT be taken internally. The latter is used in lotions or liniments that are applied to the skin. Rubbing alcohol is generally isopropyl.

Children are particularly sensitive to alcohol because it can dangerously lower their blood sugar (it interferes with the liver's ability to produce blood sugar because the degradation of alcohol takes precedence). Drinking alcohol on an empty stomach or after fasting for 24 hours also lowers the blood sugar. Small children are more sensitive to alcohol's effects on their reaction time, muscular coordination and its reactions with other drugs than are older children or adults.

For children we must remember that anything swallowed that contains alcohol can be a potential hazard — medications, mouthwash, perfume and cologne can produce hypoglycemia. Children are attracted to pretty colored liquids and "interesting" flavors and the bottles are often easily available in the bathroom. TV commercials may give an erroneous impression that mouthwashes are good to drink. They're not — they shouldn't be swallowed — the alcohol has been denatured. Children have been accidentally poisoned by these brightly colored liquids. Many dentists feel that mouthwashes should have child-proof closures and special warnings IN LARGE TYPE to parents about the hazard. They would also like the amount of alcohol in these products reduced. Some are higher in alcohol than beer and wine (see chart).

FDA in 1982 asked the American Academy of Pediatrics to review drugs likely to be taken by children. The academy recommended limiting alcohol to 5%, children under six should receive no medicines with alcohol unless under a doctor's supervision and the size of the container should be small enough to prevent lethal ingestion. Another expert panel said children under six should not be given cold/cough medicines with more than 10% alcohol. FDA is evaluating these and other recommendations. Until regulations are changed, parents of small children should be extra vigilant about products containing alcohol that their kids might consume. AND BE SURE TO READ ALL THE INFORMATION ON THE LABELS.

Cough and Cold Medicines (OTC)	% Alcohol
Nyquil	25.0
Robitussin	25.0
Contac Jr. (for children)	10.0
Novahistine DMX	10.0
Vick's Formula 44	10.0
Children's CoTylenol	8.5
Benylin	5.0
Sudafed	2.4
St. Joseph (for children)	0.38
Mouthwashes (OTC)	
Listerine	26.9
Scope	18.5
Signal	14.5
Cepecol	14.0
ACT	7.0
Fluorgard	6.0

The above Buyword Column is summarized from an article in the November 1984 FDA Consumer.

CO-OP
1/7/85

Potato Topping Tips

Home economist Helen Black will visit the University Avenue Co-op Center this week on Thursday, January 10, from 3:30 to 6 p.m.

Make plans now to stop by with your questions or comments about recipes, nutrition, Co-op centers or consumer issues. The Co-op home economist can also be reached by calling the Co-op main office on Tuesdays, 9 a.m. to noon and 1 to 4 p.m., at 526-0440.

The free home economist information sheet for this week is "Toppings for Baked Potatoes," N-50. This sheet has suggestions for lower fat, lower salt toppings for a very valuable food. Stop by and pick up a copy at the home economist counter in any Co-op center.

Lifeline Recipe

VEAL SUPREME

1 pound boneless veal, cut in cubes
3 tablespoons flour
2-3 tablespoons oil
½ cup chopped onion
½ cup thinly sliced celery
1 cup sliced mushrooms
1½ cups well-flavored broth
1 cup tomato juice
small piece bay leaf
¼ teaspoon thyme
½ teaspoon salt (optional)
¼ teaspoon pepper
½ cup sliced water chestnuts

Roll veal cubes in flour. Heat oil in heavy skillet, add floured veal and cook slowly until browned. Add onions, celery and mushrooms and continue cooking until vegetables are limp. Add bouillon, tomato juice and seasonings. Cover and simmer until meat is tender, about 1 hour. Add water chestnuts and heat through. Serve over rice. Makes 3-4 servings.

Life Line Foods

LIFE LINE FOODS — low price, good nutritive value. On sale 1/7/85 thru 1/13/85. Chosen by Co-op home economists.

PROTEIN FOODS

Boneless Veal Stew Slightly over Life Line price but makes a great stew. See recipe ..... lb. **$2.19**
Bulk Black Turtle Beans Add cooked drained beans to any salad ..... reg. 61¢ lb. **.49**
Foster Farms Whole Fryers Smaller chickens are usually somewhat lower in fat. ..... lb. **.69**

VEGETABLES & FRUIT

Carrots from Bakersfield For exercise freaks: raw carrots are great for the jaw muscles! ..... lb. **.25**
Zucchini from Mexico Tender and tasty but low in nutritive value. ..... lb. **.39**
Fancy Navel Oranges from San Joaquin. A very good price. ..... lb. **.29**

MILK & CHEESE

Co-op Nonfat Dry Milk For best flavor, mix 12 hours before drinking ..... reg. $4.19 32 oz. **3.69**
Co-op Evaporated Milk New, lower-lead can. Also smaller in size. ..... reg. 49¢ 12 oz. **.41**

GRAINS & CEREAL

Bulk Wheat Bran Use with discretion. Too much can interfere with mineral absorption. ..... reg. 33¢ lb. **.25**
Bulk Long Grain Brown Rice Makes a good pilaf with lots of chopped green onions, parsley, peanuts .... reg. 49¢ lb. **.39**

ALSO

Minneloa Tangelos from San Joaquin. For people who can't be bothered with seeds. ..... lb. **.59**

Here's More on Affordable Housing: Info, Resources and Workshops

By Jaques Kaswan

The Co-op News recently published some useful contributions relating to the housing crunch. In his November 5 article, Tom Dolan suggested that joint ownership of multi-unit properties helps people who earn a decent living but don't have enough income to buy a home. Yet as Kathleen Hirooka notes in her December 10 letter, such ownership may remove rental units from the housing market, worsening the housing shortage for renters.

A community can remain vital and dynamic only if it has a varied population. Such variety can only be maintained if everyone can obtain attractive housing which fits their lifestyle and is within their means. There is a need for new construction of rental housing for low income people, for second unit construction, for the rehabilitation of old buildings, for the conversion of industrial space to housing, and much more. Here, I will address only the main options open to people with limited means who have no access to government assistance.

Probably the lowest cost option is to rent a room, but this usually provides few amenities. Jointly renting a house or apartment is perhaps the most widely used low-cost option, though from $500 to more than a $1,000 per person may be required for first and last month rent and security deposit. Those who have a few thousand dollars may buy a house together. The sharing of facilities may range from separate uses of common space to varying degrees of shared activities, like cooking or eating together. Many rent or buy together with others not just because it's relatively inexpensive, but because they like a lifestyle that emphasizes cooperation and sharing. For others, the limited privacy in such arrangements is a drawback and in cases of joint ownership, the sale of one's interest may not be easy.

People who have several thousand dollars can jointly purchase a duplex or larger property and then occupy the units. This option provides many of the advantages of ownership and privacy, affords input on the selection of neighbors and creates the opportunity for developing a congenial community. Drawbacks of this approach are that if people just want to "do their thing" they may resent the time and energy it takes to work things out with co-owners. Also, assuming that the buyers will not evict current tenants, it may take some time before the units become vacant so that the buyers can move in. Co-ownership may also have negative social impact if it reduces the availability of rental units.

A potentially important housing option is Limited Equity Cooperatives (LEC). These can be formed through the conversion of existing apartment houses into tenant owned cooperatives. Unfortunately, there is currently only one unsubsidized co-op of this kind in

more page 16

Photo by Jane Scherr

Affordable housing, such as the Savo Island Co-op, is desperately needed.

Co-op News

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For address changes, call 526-0440. For information on display advertising, call 549-0111 or 383-1570. Subscription price: $2 a year for Co-op members, $5 a year for non-members. Membership information is available at all Co-op centers. Second class postage paid at Berkeley, California. Postmaster, Send Form 3579 to: 1414 University Ave., Berkeley, CA 94702.

Change of Address

Co-op must pay 25 cents each time change of address information is supplied by the post office. And Co-op members pay a forwarding charge to have the post office re-route their Co-op News to a new address.

If you have moved, will be moving soon or will be away from home for an extended period of time, save money for yourself and your Co-op by filling out the form below and mailing it with your old address label to Change of Address, Co-op News, 1414 University Ave., Berkeley 94702. (If you do not know your Co-op number, it appears on the address label of your Co-op News.)

Name(s) _____
_____
(as they appear on address label)
New Address _____
City/Zip _____
Co-op # _____
Date Effective _____

Affordable Housing

from page 15

Berkeley, though efforts are underway to develop others. Joining an LEC may require a $2,000 to $5,000 downpayment, but monthly costs are likely to be close to rents in the beginning and rise only to the extent of increasing costs. Though such co-ops remove housing from the rental market, they also take the buildings off the speculative market, since they cannot be sold to profit the members. Also, California law limits increases in the value of the shares to a maximum of 1% a year (assuming a 10% downpayment), so that the units remain permanently affordable. The advantages and drawbacks of LECs are similar to other co-ownership options, except that they tend to be larger, containing a more varied community, and are affordable to a wider range of people. The development of LECs tends to be more complicated than the partnership arrangements characteristic of smaller co-ownership properties. A monograph describing LECs in detail is available for $4.00, postpaid (see address at end of article).

From a co-op perspective, all of these housing arrangements are significant because they can be unique opportunities for creating a sense of community that is missing from many people's lives. But it is often difficult for people who are looking for housing and meet as strangers to learn to know and trust one another and find effective and compatible ways of making the many unfamiliar legal and social arrangements required to establish one of these settings. They need to find partners with compatible lifestyles and then develop procedures for sharing work, make effective decisions about management, cost sharing, maintenance, etc., learn how to resolve conflicts among themselves, and at the same time assure themselves of some privacy and also have some fun.

These housing arrangements also require attention to legal issues, like responsibilities for the ownership or lease of a property, financial obligations, disposal of interests, and contractual relatons among members. And no one should enter into any kind of housing without being clear as to all of the costs involved, so that some skill in analyzing financial feasibility is needed. As with anything else, those who are prepared and informed are most likely to succeed.

A number of resources are emerging to assist people in forming and operating these housing arrangements. One set of resources is a cooperating network of professionals with expertise in real estate, law, group process, construction, financing and other relevant specialties. They provide a wide range of consulting and educational services. (For a list of these professionals, send SASE to address at end of article with indication of the service desired.)

One of the groups in this network, Urban Alternatives, Inc., a non profit organization, is offering a series of five housing workshops. These will be held weekly in Berkeley, from 7 to 10 p.m., beginning the third Monday in January. The weekly workshop topics are: 1) Co-ownership of Small Multi-Unit Properties; 2) Limited Equity Cooperatives; 3) Sharing a House or apartment; 4) and 5) Operating as a Community. The cost will be $50 for the series, though the first three sessions can be taken individually. For more details, contact Urban Alternatives, Inc., 1740 Walnut St., Berkeley 94709, 540-5387, 547-6772.

Jaques Kaswan is a developer of housing and other types of cooperatives. He is a member of the Shattuck Avenue Co-op Center Council.

Martin Luther King Jr. Birth Commemoration

The Berkeley/Richmond Jewish Community Center will honor the birthday of Martin Luther King, Jr. with "The Legacy of Martin Luther King, Jr.," a film and panel discussion on Tuesday, January 15, as part of its ongoing Kitchen Politics Series.

The program will begin with the showing of the film "Reverend Martin Luther King, Jr.," an account of King's involvements in the Civil Rights and Anti-War Movements. Immediately following the film, three panelists will relate their personal involvements in civil rights work. Included in the discussion will be an analysis of what progress if any has been made since King's death and how his legacy can be seen at work in the actions being taken against South Africa's apartheid policies.

Participating in the panel discussion will be Berkeley City Council Member Don Jelinek, attorney; Pearl Marsh, civil rights activist and post-doctoral fellow in political science at UC-Berkeley; and Jean Freedberg, media specialist and former resident of South Africa.

The evening's activities will begin at 6:30 p.m. with a brown-bag dinner in the JCC Kitchen Cafe and move to Room 14 at 7:30 p.m., for the film and discussion. The cost for the entire evening is $4, $2.50 for JCC members.

The Berkeley/Richmond Jewish Community Center is located at 1414 Walnut St. (corner of Rose), Berkeley. For more information, call 848-0237. The center is wheelchair accessible on the Rose St. entrance.

Stress Reduction Skills Taught In CommonHealthCare Course

Photo by Jane Scherr

If your world seems to be turning upside down, and you'd rather not go through life standing on your head to get it right side up, CommonHealthCare's course on stress reduction and lifestyle enhancement might be just what you need for the New Year. CommonHealth is a leader in preventive health care and hundreds of Co-op members have taken advantage of the low cost health tests they periodically offer at Co-op centers.

A ten-week course entitled "Stress and Lifestyle Enhancement," designed to improve participants' health and fitness, will be given on Tuesday evenings, beginning January 22 and ending March 26, from 7 to 8:30 p.m. The series is offered by CommonHealthCare, a non-profit community agency, at 116 Montecito Ave., Oakland.

For the past two years CommonHealthCare has offered this course to help people in making beneficial lifestyle changes in order to avoid or to deal with chronic disease, and to enhance their wellbeing. Participants will acquire skills for managing and reducing mental and physical strain, and assistance in incorporating principles of nutrition and exercise into their daily routines. They will be assisted in designing and monitoring their own behavior-changing programs.

The course was developed four years ago for the Alameda Health Care Service Agency by staff from the Stanford University School of Medicine and the Stanford Heart Disease Prevention Program. The upcoming course will be taught by Pat Davis, MPH, a health educator for the City of Berkeley Department of Health and Human Services, and a certified trainer for the Alameda County Health Care Service Agency.

The fee for the course will be $40 for CommonHealthCare members, $45 for nonmembers, with an additional $10 fee for materials. For registration or more information call CommonHealthCare at 834-9022.

5% Off, January 15

Tuesday, January 15 is Member Appreciation Day. That's when all Co-op members receive a 5 percent discount on everything at every Co-op center.

To get the discount, members should show either their check cashing card or, if they do not have a card, the address label from their Co-op News. Those who are not Co-op members can qualify for the discount immediately by joining the Co-op. Another Member Appreciation Day is scheduled for Tuesday, February 12.

JANUARY

SALES

Co-op & Community Roundup

Meet Board Candidates At Your Co-op Center

Candidates for the Co-op Board of Directors will be visiting Co-op centers this month to talk with Co-op members and shoppers. Make plans now to stop by with your questions and comments about Co-op. The schedule is as follows:

Shattuck Avenue: Tuesday, January 8, 4 to 5:30 p.m.
Telegraph Avenue: Tuesday, January 8, 7 to 8:30 p.m.
Northpoint: Thursday, January 17, 4:30 to 6:30 p.m.
Natural Foods: Monday, January 21, time to be announced.
University Avenue: Monday, January 21, time to be announced.

The following Co-op members are candidates for the Board of Directors:

Bob Boileau of San Francisco
Margaret Gordon of Berkeley
David Kirkpatrick of Berkeley
A. Robin Orden of Berkeley

The board election will be held by mail from January 21 through February 3. Ballots will be sent to all Co-op members together with their annual patronage statements. This mailing is scheduled for January 16.

Free Tai Chi Classes For Co-op Members

Free Tai Chi Chuan classes will be offered to Co-op members on Wednesdays, from 5:30 to 7 p.m., starting January 16. There will be a charge for nonmembers. To qualify for free admission, members should show either their check cashing card or, if they do not have a card, the address label from their Co-op News.

Class instructor Jim Spira has been teaching Tai Chi in the Berkeley area for 4 years, previously through the Berkeley Holistic Health Center, where he was director of educational services. The emphasis in these classes is on giving detailed attention to each individual's special skills and problems, in order to help them develop to their maximum potential. The traditional long Yang form will be taught, along with special exercises which emphasize principles fundamental to Tai Chi and all human movement. Tai Chi Chuan is beneficial for correcting physical problems such as stress, joint and back pain, and improving cardiovascular performance. For this reason, hundreds of millions of Chinese practice Tai Chi every morning. Yet Tai Chi Chuan is also a traditional meditation system, used by Taoists to become more unified with every action they undertake. Tai Chi can be practiced every morning or evening by oneself or with a group, and in later stages is also extremely beneficial for self-defense.

Help for New Parents Going Back to Work

Three events for parents of infants will be offered by Bananas in January. All are designed to help parents make a smooth transition between being at home and going back to work.

Choosing Infant & Toddler Care — a workshop on the in's and out's of finding and choosing child care for very young children will be given by Bananas' staff on Wednesday, January 23, from 10 a.m. to noon.

Leaving Baby & Going to Work — a discussion group for parents who want to talk about the emotional side of leaving baby in child care and returning to a job will be held Tuesday, January 15 at 7:30 p.m.

Nursing & Working — a group for mothers who are planning to work and continue breastfeeding will take place on Friday, January 18 from 9:30 to 11:30 a.m.

Babies are welcome to all of the above. All meetings are held in Bananas main floor space, enter at 6501 Telegraph Ave., Oakland. For more information or to register for any of the parent groups, call 658-1409.

Free Income Tax Tips At UA Co-op Center

"Income Tax Tips" will be the subject of a free seminar sponsored by Consumers' Group Legal Services on Saturday, January 12, at 1:30 p.m. in the meeting room of the University Avenue Co-op.

Tom Andres, CGLS panel attorney and CPA, will be the speaker.

Calendar

JANUARY

8—Shattuck Avenue Center Council, 7:30 p.m. Shattuck Avenue
8—Telegraph Avenue Center Council, 7:30 p.m., Telegraph Avenue
9—Board of Directors, 7:30 p.m., Shattuck Avenue
10—Travel Committee, 7:30 p.m., Shattuck Avenue
15—Member Appreciation Day, 5% discount for Co-op members at all centers.

RESOURCE ONE

TECHNOLOGY FOR THE PEOPLE

A NON-PROFIT COMMUNITY GROUP SHARING INFORMATION AND SKILLS

Resource One Newsletter Number 2 | April, 1974 | 1380 Howard St. San Francisco, Ca. 94103

URBAN DATA BASE

The "Urban Data Base" is a collection of information, gathered from various government agencies, about different neighborhoods in San Francisco. The information includes census data, election returns, and data on land use and property valuation, assessment and ownership.

We hope that our computer can be the necessary "intermediate" for making this information available to people in the community. We are working on programs that format this information into reports and will train people from community organizations to use the programs to give them access to the data that is important for their work.

This information can be used to answer questions about economic levels in a neighborhood, how a precinct voted in the last election, who owns a piece of property and how much is it worth, and many other questions which a neighborhood group might want to know about its neighborhood.

Resource One Social Service Referral Directory

The Social Service Referral Directory (SSRD) is a unique service whereby social service agencies and other interested groups in San Francisco have access to good information, updated monthly, as to what services are available for the people who need them.

Agency listings are arranged alphabetically in a looseleaf binder to facilitate the monthly additions and to allow a user to rearrange at will. Each listing is on a separate page and includes detailed information on the services offered, how they are obtained, access via public transportation, languages other than English spoken and other useful information.

The index is organized to enable a person to find quickly which agencies offer the kinds of services sought: according to the type of service (*e.g.* alcohol abuse, drug abuse, child services, medical, neighborhood, etc.) and the type of clientele served. Where appropriate, there are notations indicating what languages are spoken by agency staff or what special group is served.

Access to the SSRD is by subscription; a user receives a copy of the initial directory (as it stands when the subscription begins, currently over 240 agency listings), monthly updates on existing entries where there have been substantial changes, a group of new agency listings expanding the directory, new and updated indexes, and status reports on the currency of the information.

Information for the directory is gathered by the directory staff, who maintain contact with a large number of relevant service and referral agencies in San Francisco. Updates are based either on periodic calls made to all the agencies in the directory, or on notification by a contact person in an agency. In the first five months since publication, over 30% of the listings were updated.

The agency information is entered into the computer by typing it on a terminal. The data is then

(continued on page 2)

WHO WE ARE

Resource One is a dozen people confronted with complete control and total responsibility for fifty feet of grey boxes called an XDS-940 time-sharing computer. The milieu is anti-profit and directed towards social change with decisions made by consensus at weekly staff meetings. The basic tensions of the situation center around the problems of a politically diverse, self-managed working group with heavy commitments and considerable resources, and they center at the fundamental tension between person and machine:

> Can this tool of a militarized society be made directly useful to people?
> How?
> Are the costs of being body-servant to the Beast worth the unclearly defined gains?
> Are we risking dependence on an overgrown, high-level technology?
> What should we do with all the technological tools we've aquired?

It's a unique situation, rarely has any alternative group controlled so much "hardware" that's so difficult to use well. It's rather like a play with a set, setting and characters but no script.

So far the dialectic has produced a Directory of Social Services in San Francisco, an information retrieval system useful for indexing, searching, sharing and manipulating data for groups doing research directed towards social change, a public access information sharing network, a collection of government (census, housing, election, etc.) data about San Francisco made available to individuals and community groups, various services for social change groups, many burn outs, arguments, late nights of hard work, disgust with the whole thing and a continuing feeling of challenge.

This is a people controlled machine or remarkably close to it. There are no rules of membership to Resource One; anyone who can more or less get along with the current staff and survive in the chaos can join the process by making a contribution to it through work and the development of new uses. Anyone who wants to use the machine can approach the staff; access is allocated on the basis of usefulness to people, energy drain on Resource One, staff interest and the economic reality of having to feed both the machine and people in order to get work done. There are lots of possibilities and we need a lot of help. What real work would *you* do with a computer?

The 'Counting House' opens soon

The San Francisco Foundation, on March 7, 1974, approved a grant of $23,600 to Resource One for the purpose of setting up a pilot accounting program (the Counting House) for non-profit organizations. The Counting House will be a storefront office equipped with a computer terminal, which is hooked up to the Resource One computer via telephone.

At Resource One, a program is being written in FORTRAN II to handle all the basic reporting requirements of small organizations ("users"). A given user will type in all the raw data (requiring less time than hand-posting now takes), and the program will produce a variety of reports on demand. The input data will be things like cash disbursements (off check stubs), cash receipts (from checkbook), billings, etc. The program will check every item, as it is entered, for proper format and completeness. (E. g. Is the decimal point where it should be? Are the numbers "reasonable"? ERROR MESSAGE; YOU FORGOT TO ENTER THE ACCOUNT NUMBER!!) Reports can be generated for any given accounting period (month, quarter, year), and for any account or group of accounts. The program will be very easy to use — even for people who have had no experience with computers.

An "operator" — trained in bookkeeping techniques and basic computer programming — will attend the Counting House terminal full-time, to help in case of trouble, teach users how the system works, and serve in general as a bookkeeping consultant.

The accounting office will share space with a neighborhood Community Memory location in San Francisco, which hasn't yet been chosen.

We would like to have a storefront in a relatively high-traffic area (like the Haight, Mission, Noe Valley or Civic Center areas). We're not at all averse to sharing space with another group. If you know of a space that isn't too expensive, coming up for rent, or if you're interested in sharing space with us, we'd appreciate hearing from you.

Social Service Referral Directory

(continued from page 1)

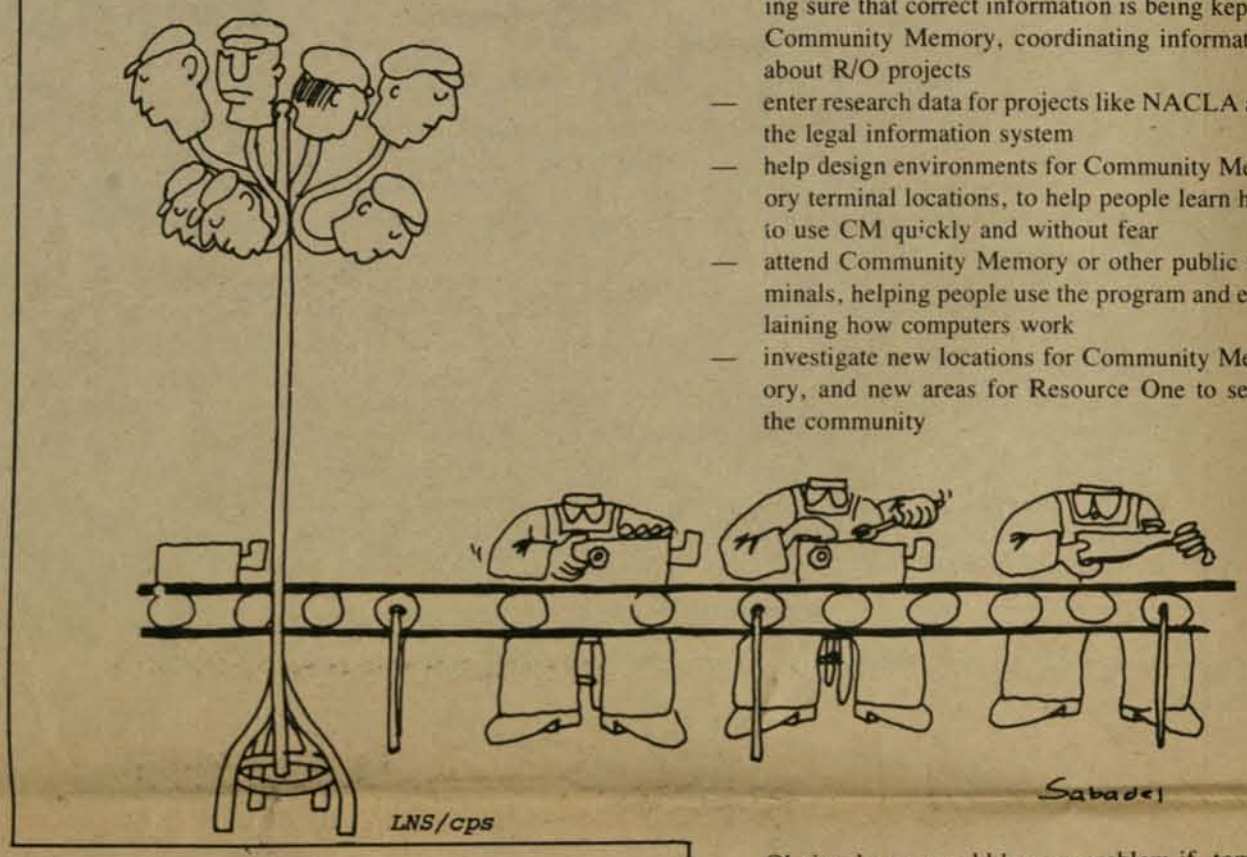
stored both in the machine's on-line (disc) memory and backed-up on magnetic tape. Formatting is done by the computer and the information is printed out onto paper offset printing masters directly from the machine's high-speed printer.

When data on an agency is changed — whether one word, a phone number, or large sections — only the specific changes have to made in the computer's copy of the data, while the computer prints a complete new page for the agency. Each subscriber receives a copy of the new page and replaces the outdated page in his copy of the directory.

The various indexes are currently produced offline while the design criteria for programmed indexing aids are being developed. In the future, the directory information will be interfaced with ROGIRS and Community Memory functions to provide on-line retrieval of the listings by appropriate "keywords".

The SSRD grew out of a basic motivation in Resource One even before its metamorphosis out of the San Francisco Switchboard organization — making available vital information to people in new ways. Early in 1973, as the time-sharing system was becoming usable, the directory emerged as a possible solution to the problem that directories of social services were being created every other year as one-shot printed books which were both incomplete as to the parameters of services and out of date as soon as they were delivered. Meetings with persons active in referral work were held to explore their needs and the feasibility of a computerized, updatable system. Within six months the directory was delivered to the initial subscribers, and after another half year it is now rapidly growing.

The SSRD is an initial application of a general information retrieval system; a model of one way of distributing vital information that changes frequently. We feel that the success of this type of directory is not unique to the field of social services but could extend to many other areas as well. We are currently exploring the possibilities of producing an educational resources directory and are meeting with people in other fields to discuss how a directory might serve their needs.



SSRD 02/05/74

** SELF-HELP FOR THE ELDERLY **

ADDRESS: 3 OLD CHINATOWN LANE, S.F. CALIF. 94108

TELEPHONE: 982-9171

AGENCY DIRECTOR: SAM YUEN

SERVICE: ASSISTANCE WITH INDIVIDUAL PROBLEMS, GROUP ACTIVITIES, HOUSING, EMPLOYMENT (DING HO, HOUSEKEEPER TRAINING), FOOD PROGRAM, CONSUMER ASSISTANCE AND EDUCATION, COMMUNITY PLANNING, YOUTH FOR ELDERLY PROGRAM.

EMERGENCY SERVICE: FOOD VOUCHERS (GROCERY AND RESTAURANT), HELP IN APPLYING FOR WELFARE AND OBTAINING HEALTH SERVICES.

PERSON TO CONTACT: SAM YUEN OR ANY STAFF PERSON

HOW DOES ONE OBTAIN SERVICES: DROP-IN OR APPOINTMENT IN PERSON OR BY PHONE

ELIGIBILITY FOR SERVICE: ANY LOW-INCOME PERSON OVER 55 YRS. OF AGE

AREA SERVED: PRIMARILY CHINATOWN, NORTH BEACH AND LOWER RICHMOND AND ANY CHINESE PERSON IN S.F. WITH NO ENGLISH.

HOURS: M-F, 8:30 TO 5:30P.M. (PORTABLE MEALS 7 DAYS A WK.)

FEES: NONE EXCEPT PORT. MEALS $1.00 PER DAY(2 MEALS AT 50 CENTS A MEAL), IF THEY CAN AFFORD IT.

LANGUAGES SPOKEN: CHINESE, TAGALOG, ILOCANO, JAPANESE, SPANISH

ACCESS BY PUBLIC TRANSPORTATION: 30 STOCKTON BUS

COMMENTS: FUNDED BY OEO, EOC AND STATE COMMISSION ON AGING AND CATHOLIC CAMPAIGN FOR HUMAN DEVELOPMENT.

LAST UPDATE: 1/16/74 FROM SAM YUEN

A typical page from the Resource One Social Service Referral Directory.

PEOPLE RESOURCES

The prime motivation of the Resource One work collective is to create new techniques and add new tools to the ones now being used by organizations and people involved in social change. Some of the specific projects we get involved with are somewhat hard to view from that perspective, being done mostly because they bring in money, but even those projects can help us understand how to survive in the environment we're part of.

It should be clear, from a reading of these pages, that there are many oportunities for involvement by people who are not now part of Resource One. Most such situations call for people who can afford to volunteer their time; in some cases, where the mutual advantage is very clear, some money is available for subsistence. Of course, we are always open to proposals from people who want to use our tools in constructive, innovative ways, as part of a project of their own.

At this writing there are lots of possible projects to which people would be welcome to contribute their energies. Only a few of these would require any special computer skills, since most of the basic programming has been done. Examples of what people could do:

- organize a comprehensive (or fragmentary) education program at Resource One or elsewhere, designed to promote discussion of how computer technology could be better used in the community, and information on how it is mis-used by business and government
- organize the internal information flows of Resource One, keeping track of what other organizations are doing through correspondence, making sure that correct information is being kept in Community Memory, coordinating information about R/O projects
- enter research data for projects like NACLA and the legal information system
- help design environments for Community Memory terminal locations, to help people learn how to use CM quickly and without fear
- attend Community Memory or other public terminals, helping people use the program and explaining how computers work
- investigate new locations for Community Memory, and new areas for Resource One to serve the community

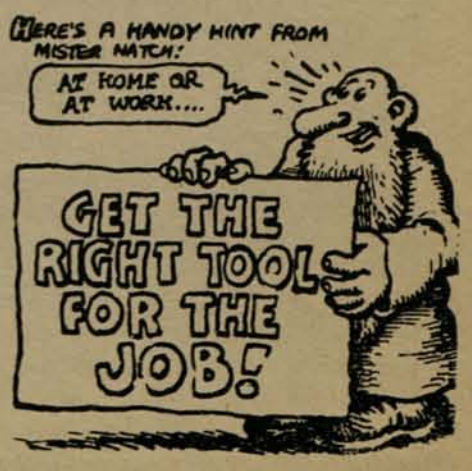
Obviously we would have a problem if, tomorrow, fifty people walked in wanting to get involved. We have had problems in the past with finding something for one person to do. That's because we are already short-handed in relation to the number of balls in the air at one time. So don't expect a well-thought-out on-the-job training program from us.

We hope that many people will pick up on the projects described in this newsletter, and think seriously about whether the projects, the processes or the tools involved could apply to their own lives and goals. If you are such a person, please let us know.

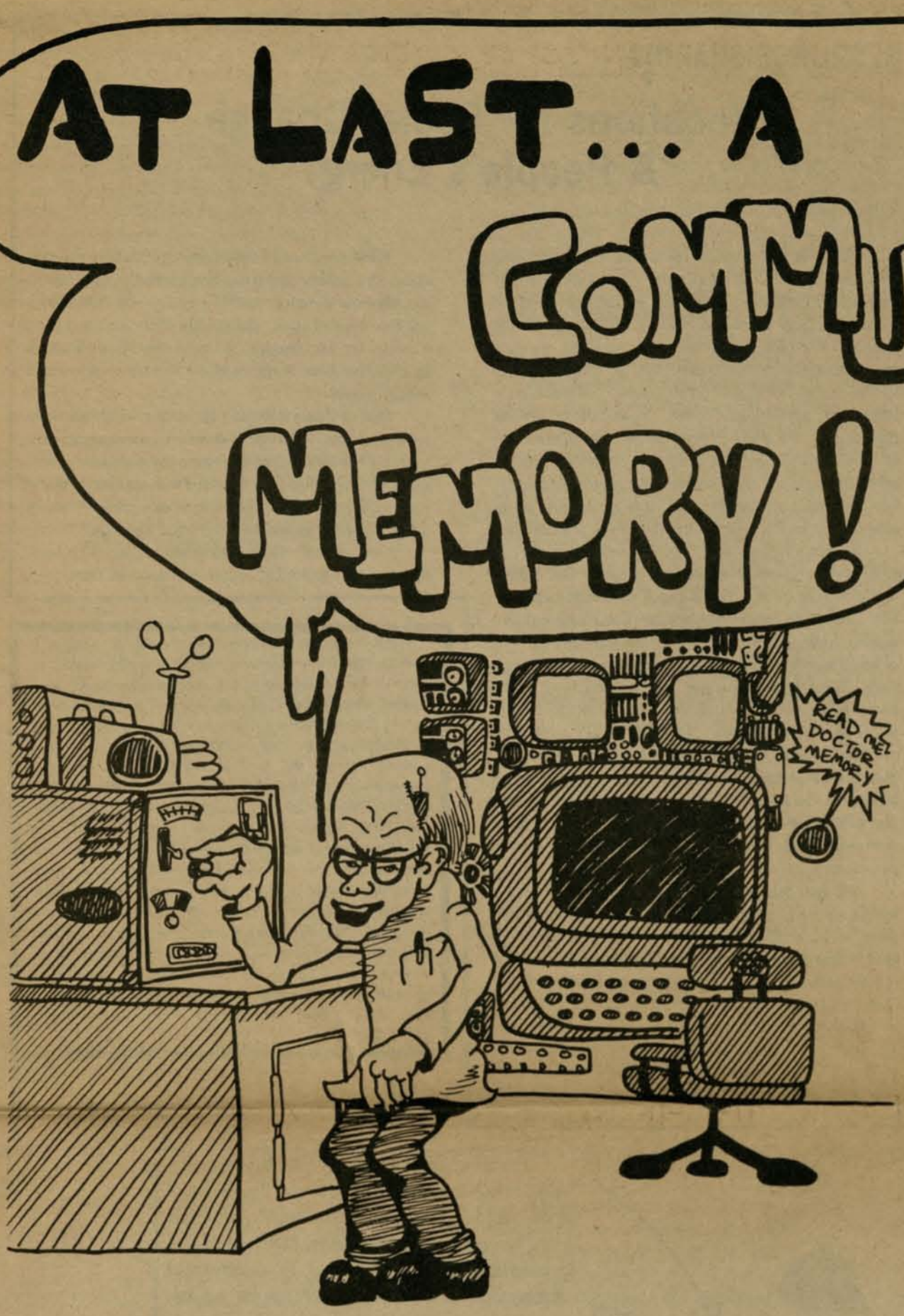
Female energy is sorely lacking here. It seems that out of every ten people who come around, all ten are men. This phenomenon naturally affects the atmosphere and hinders development.

It doesn't matter if you are a "computer person". We need people who have a concern for the direction in which technology is leading society, and want to help reverse the situation. We need people who have been in other groups and collectives and know how to make them work. If you just have some new ideas about communications at the people level, come around. These things apply equally well to women as men.

More women are *absolutely necessary*, so bring your friends.



AT LAST... A COMMUNITY MEMORY!



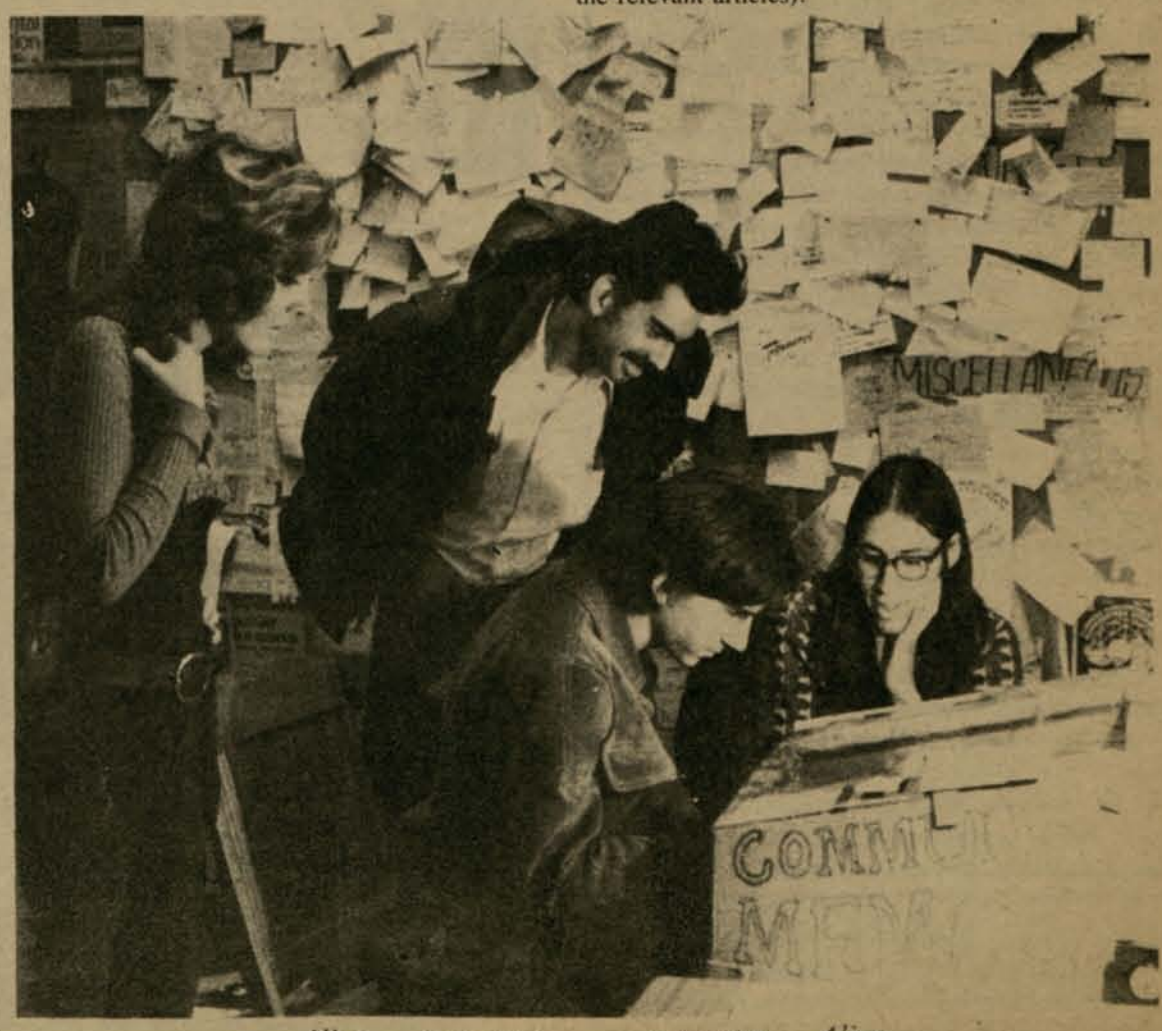
The seed of a national public access information net was planted last August in Berkeley. A teletype terminal connected to the Resource One computer was placed in the lobby of Leopold's Records, and people were encouraged to use it as a combined electronic bulletin board and data store. In keeping with our aspirations we've named this *COMMUNITY MEMORY*.

Since then several thousand people have discovered the terminal and typed in messages, classifying their items themselves so other people can find them quickly. The collection, with over a thousand active items now, includes exchanges traditional to other public media— bulletin boards, classified ads, telephone poles, bathroom walls; the type of information found in indexes and directories such as People's Yellow Pages; as well as exchanges and dialogues which are developing their own unique forms. There are cars for sale, rock bands looking for bass players, carpenters looking for jobs, groups offering counselling, tennis players looking for partners, political commentaries, etc. etc.

This seed is now sprouting into a network. The Leopold's terminal has been moved to the Whole Earth Access store. Specialized, indexed listings of parts of the data collection are being left with organizations that find them useful; a music directory, for instance, is left weekly at Leopold's. Additional public access terminals now exist at our office in Village Design in Berkeley (1545 Dwight Way), at the Mission branch library in San Francisco, and another one will soon open as part of the Counting House. Furthermore, large amounts of information are being collected and made available by NACLA (North American Congress on Latin America) and by People's Energy and Vocations for Social Change (*cf* the relevant articles).

Change is possible. As relative as good and bad are, actions may be weighted on that scale and the quality of global human existance improved.

We are embarked on growing with an information exchange which we are also helping develop. The hardware and software development we at Resource One and Community Memory are undertaking is nested within a continuingly expanding dialogue making use of tools we tend. We are thus interested in direct contacts, direct information, direct access by people affected by power to information on that power, liberation of power from the constricted grasp of the few to its rightful place as the wealth of the information-sharing community. This involves detailed, precise, valued struggle in a lot of media – money, education, politics, distribution, video, print, speech ...



Alice.....computer – computer.....Alice

Our first Community Memory terminal (inside the cardboard box) at Leopold's record store. The competition is in the background.

Theories are an expression of how we see the world. They articulate the paradigms of the societies evolving them, defining the worlds in which their actions take place. These de-finitions are active, on-going, and substantial (incarnational) — they have real effects in the real world.

Learning Exchange Node?

On November 26, 1973, Resource One took part in a "Conference on Computer-Based Learning/Living and Information Exchanges" — held in Evanston, Illinois. Our XDS-940 was connected by phone to a CDC-6400 in Evanston which, over the previous week, had been collecting messages and comments from all over the country. On November 26 a live link was established between the computers, and exchanges were sent across the country as they were created by participants. On Resource One's side, these included about a dozen people involved in learning and communications groups from this area who came to Resource One, read what had been previously entered, and shared their own thoughts.

The theme of the conference was Ivan Illich's *Deschooling Society*. "Deschooling" refers to the creation of a non-coercive process of and network for learning, "learning webs" to de-institutionalize the current educational system. This resonates with the original inspiration of many of us which led to involvement with the Community Memory project — seeing it as the communications system for a learning exchange — a means whereby messages by people who want to learn, people who want to teach, groups and institutions with resources to offer, can be exchanged in a continuous, up-dated fashion.

In our experience this begins to happen whenever the density of information interchange gets high enough. This was the case at Leopold's with musicians, who made the terminal their best means for finding each other. This is a prototype for a situation where people are looking for like- minded spirits, peers, fellow adventurers, to play with and explore — anything! A request for a source of good bagels was answered with an offer to teach the art of making bagels. There have been exchanges about languages, carpets, electronics, films, karate — and as the community information swapping develops in these areas, dialogues begin to emerge, continuing exchanges where the information itself is being transmitted through and beginning to reside in the medium.

The current step is to take this tool and to grow it as a workable learning exchange in the Bay Area, and to have it encourage the other necessary concomitants of a humane (and biologically and geologically sound) learning environment. A network alone is not enough; we will be working together with other groups to ensure that the nodes (ourselves as living, learning, teaching, sharing human beings) develop the appropriate openness and understandings.

The use of public communications by people may give them a competitive advantage over those tied to narrow private channels. More sharing of information is possible and better use of available technology can be made without continually having to develop security systems. Image of many people working together versus a few people ordering many about.

RESOURCE SHARING

Vocations for Social Change & People's Energy

VSC, or "Vocations for Social Change", is a non-profit tax-exempt educational corporation/collective with an office in Oakland California and associate offices elsewhere in the country. We publish *Workforce*, a national resource guide designed for and used by the movement for social change. We also publish how-to-organize information, and sponsor other organizations around the country. People's Energy is the closest associate of VSC, and was originally sponsored as a local VSC office. People's Energy maintains a regional resource file, publishes an East Bay resource guide, and counsels people in finding/constructing work alternatives.

People's Energy and VSC have just recently entered the Resource One user's network. Our vision and our goal is to provide much of the information base and some preliminary models for a national network, and to that end we are compiling our 6-years-worth of information on alternative institutions, from *Workforce* and our various local VSC contacts/friends elsewhere. We are planning to enter this mess (!) into our file **RESOURCE** as soon as we are familiar enough with the system to do so. Another project we are doing is indexing by interest keywords the some 100 people/month who come into our office for counselling, to begin to match them with jobs and with other people who have complementary interests.

We feel that information networking is vital for viable social change. Everything we do tells us that there is tremendous potential in knowing where to find information. It is also our feeling that we must remain self-conscious and self-critical about how we select and evaluate information, what our goals are (political neutrality being impossible), how we will use information, who will use it, how we will determine the "credibility index" of our information, how we will preserve privacy, and how high a profile we should exhibit.

What we do at People's Energy/VSC is not random. We select our resources carefully, and try to examine our contacts carefully in light of their potential for social change, and in light of their ability to be a model for that change. We actively solicit feedback in everything we do or sponsor. We try to serve as a model ourselves.

Our methods and our philosophy — all are open for discussion. We hope that our experiences can provide a philosophical springboard for guiding the network concept. We look forward to co-sponsoring the national alternative information system and becoming a full working member of the local network.

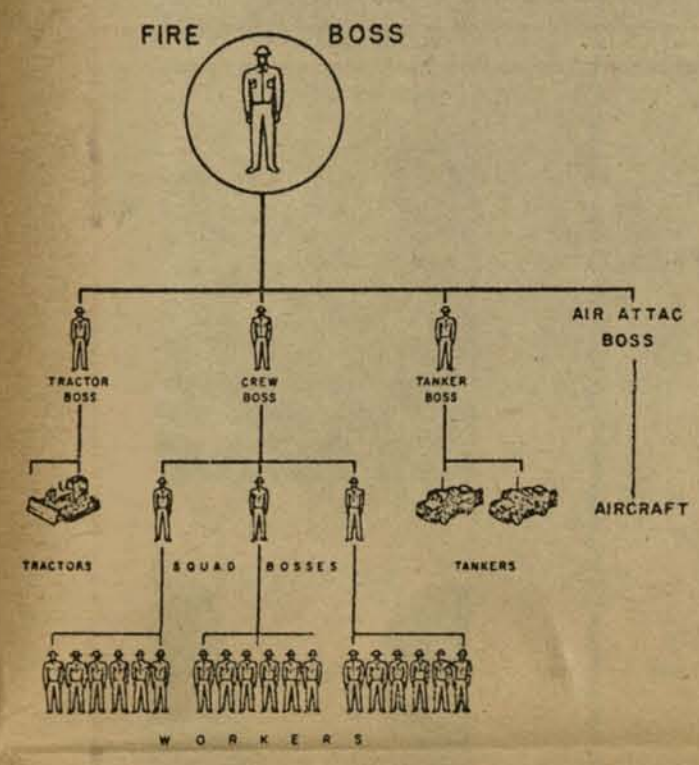
Our office: 4911 Telegraph Ave., Oakland, 94609 (415) 653-6535, open line noon to 6pm.

We supply the planetary common wealth in acting in total communication with our various actions and their respective back-and-forth-sequencings. Where we get stuff, what we do with it and how, and where it goes afterwords – staying in touch with such data is what constitutes wealth, survival possibility – and this information flow is the crucial missing link in the survival worthiness of ourselves-together-with-our-planet. The medium for this release of valuable (valued for livelihood) messages is developing amongst us – electronics media in general, basically, and specifically public accessible memory storage – leave your real-time messages for other people, and you begin to provide other people access to your history, your calendar, your time(s). We all get 'on the air'; whether this is claustrophobia, or intolerable honesty, or space of shared patterns-of-common-history; whether this requires our becoming more and more like public parks, or whatever – is up to us to create. There can be no doubt, though, that at least, the very least, we are being thrown communicationally together.

Community Memory is community mindfulness, not-forgetfulness. In the root sense of the greek word for truth, *aletheia* (*a-lethe*, having come out of hiddenness) it is communal retrieve of truth, communal disclosure, that which is (left) open, by us, to us.

Belief in our dependence on the various institutions for the necessities for continuing our daily life is a more damaging mystification than the artificially created dependence on some of their products. We no longer go directly to the person who makes or grows or knows what we need, but rather to the functionary of the appropriate institution. Fewer and fewer of our daily interactions include communication on any personal, human level, and our private lives are becoming more isolated from our social, political, and economic lives. As our isolation from one another increases, our dependence upon artificial structures to give us work and and supply our material and recreational needs increases, while our sense of powerlessness makes real our political impotence.

Business and governmental communication is done in private where the competitors and the people can not see whats going on. Any system of diffuse power must force all such communication to be public record or privilaged channels of communication and restricted information will develop and be used for the advantage of a few.



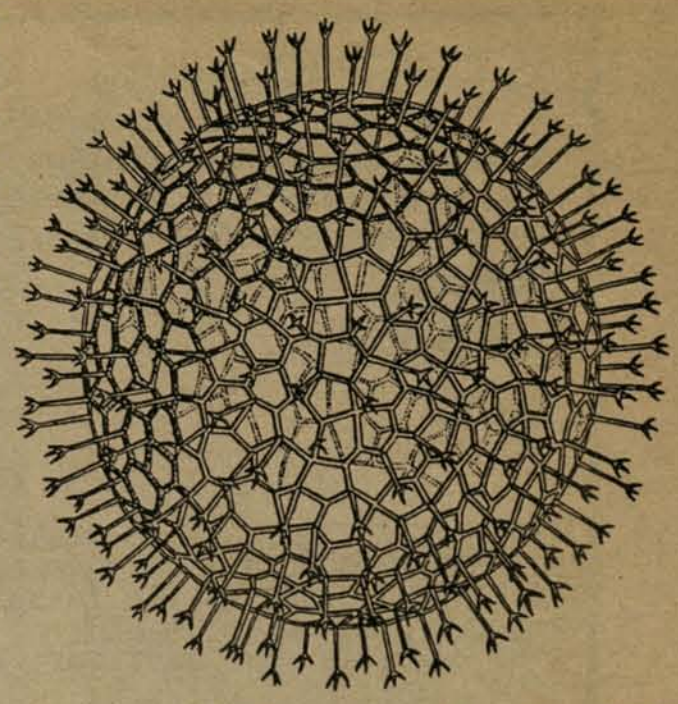
Taking economic power includes developing new economic- organizational forms small enough so that, they may be completely controlled by all their members, can act as a self-conscious unit and develop the very complex set of relations with other such units, which will be necessary if they are to take over the functions currently performed by highly structured corporations. The development of our own means of production and distribution is the only way economic power can be removed from its current masters.

A STRONG PEOPLE NEED NO LEADER

-ZAPATA

Our only hope is to talk to one another, to share our thoughts and feelings. But first we must find one another, and to do that we must assume recognizable identitiies in the amorphous human mass. It is to aid in this task that Community Memory was created. By identifying ourselves, our interests, needs, and resources, we acknowledge the parts of our lives we are willing to share with others, the groups of which we are de facto members. All the power of computer technology and Boolean algebra are brought to bear to make us accessible to one another.

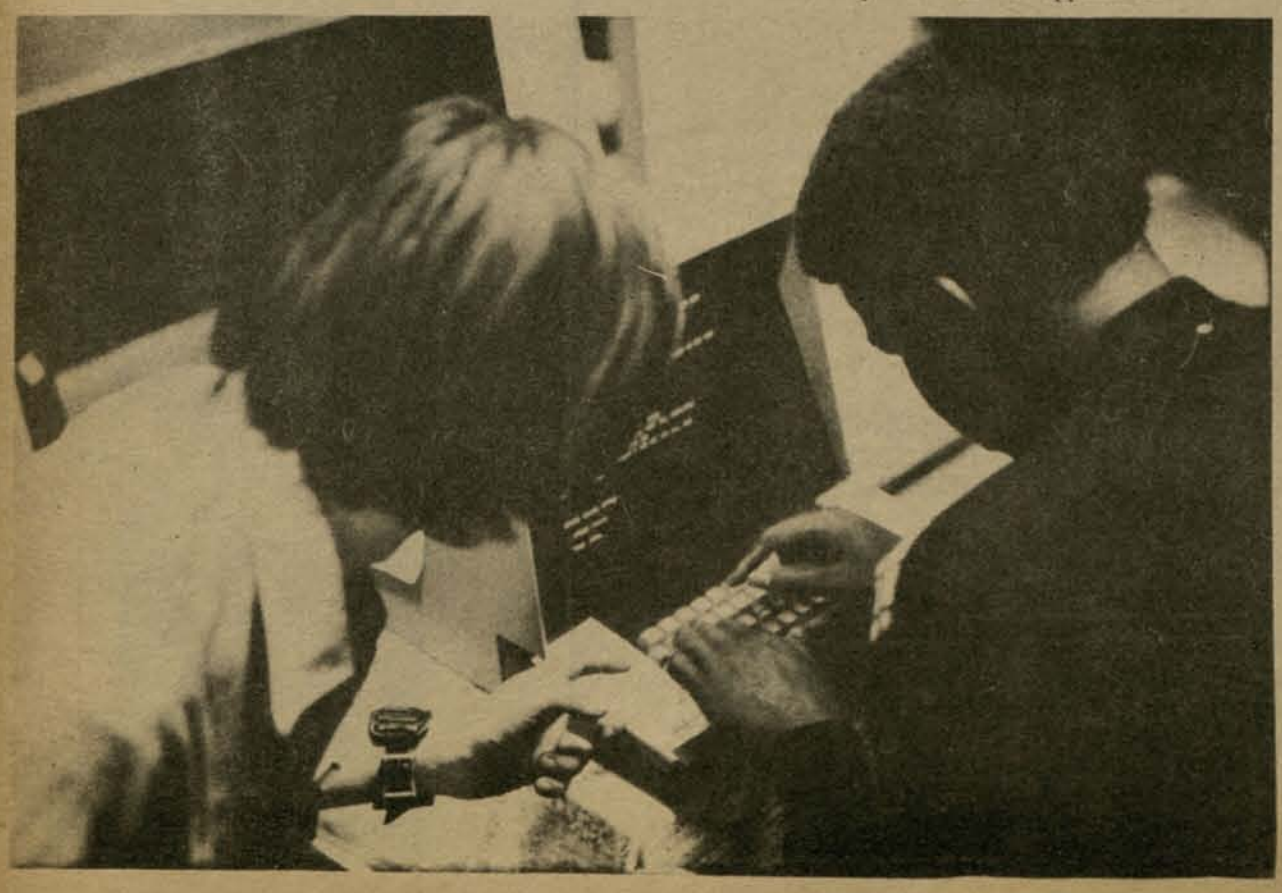
Our world seems to be populated not by people but by institutions. Recognizing governments, corporations, and unions as communication devices, information handling structures with the sole function of coordinating and securing our efforts to work and live together gives us the opportunity to seek alternatives. Bringing the consumers of goods directly in to contact with the creators is the only way of making them responsible for their own actions and responsive to one anothers needs.



A diffuse system of small collective producing, living and learning groups requires an equally spread out but very efficent system of communication. Their ablity to support themselves will depend on a rich flow of information and ideas, and the means to coordinate their efforts.

What are the possibilities of high speed, cheap national communication via computer? The minisystem networks described elsewhere are capable of communicating with each other over the phone at more than 1000 characters per second. Thus in a three-minute call two minicomputers could exchange 60 pages of information! Without making Ma Bell any richer we could have a national news network, a means of coordination for national political action, a fast mail service, and a way to hold long term dialogue on problems of greater than local interest (see the article on the learning exchange conference).

ALTERNATIVE SYSTEM



This would start us experimenting with direct government, government by ad hoc comittee of interested, knowledgable and affected people. If the flow of information was very heavy the consortium of local networks could establish a toll-free 800 number on one of the machines to be used as a relay satellite by all the others. This would not inhibit direct communication, between two networks, of information they did not want to trust to the (a, any) central machine. We can thus make a strùcture which takes advantage of both hierarchy and diffusion.

The prior paragraph is not techno fiction. Very little additional hardware and programming beyond that required for a local net would be necessary. The major requirement is keeping it in our minds while doing the design so we do not create unnecessary restrictions which make it difficult to include this facility. Thoughts on the uses and criteria for this communications system would be appreciated.

OUR NEXT BUNCH OF WORK

The pilot network is a very local happening. It is unique to this time and place without the reproductive vitality necessary to be useful elsewhere. The program is in a language only usable on the 940 and the 940 will support only 16 users. With the high cost of geriatric engineering each user's share of the expenses is about $6,000. This is far above the resources of the organizations and people we wish to serve. An additional problem is the high cost of the terminals necessary to connect with the central computer.

To make our idea evoltionarily competitive we are producing a more advanced Community Memory program in FORTRAN, the most commonly available programming language, working on cheap television and printer terminals that we would produce ourselves, and directing our work to run on the newest, fastest, smallest, cheapest technology — the mighty minicomputer. Minicomputers are available at ⅛ the size and cost of the 940 and three times its power! Not very mini. With the use of carefully selected mini hardware a system could be assembled whose purchase price would be under a thousand dollars per user, whose maintenence would cost under $150 per year per user, and would have about a million characters of storage for every user. Each additional million characters would be about $400 per user. We hope to produce or obtain terminals at about $400 each so the capital cost for a single user would be under $2000 and the yearly expenses for the system only a couple of hundred and the cost of two phone lines — one at the computer and another at the terminal. By sharing all new software development among the various networks any additional development costs could be kept under a few hundred per user too.

A list of all the hidden assumptions in the above:

1) We can write an efficent system in FORTRAN.

2) We become OEM (original equipment manufacturer) purchasers of hardware. This means all the systems are purchased through us and we get wholesale prices.

3) Large communities of users can be established for each system since the smaller the system the more it will cost per user. The above figures came from a system which could support at least 50 fulltime users and would cost about 50 thousand dollars to buy wholesale.

4) We or a similiar group manufacture a cheap terminal multiplexor, the piece of equipment via which the computer communicates with all the terminals and which is very overpriced at the the moment.

5) The opposing factors of ever-decreasing cost of computers and the current economic turbulence and maybe disaster at least balance each other out.

Our time scale is to have the first minisystem functioning and debugged within a year. We could use luck and help.

Doc Benway wanders into the Whole Earth store to check out what's happening in Community Memory. A typical sequence would look something like this (what Benway types is underlined). There is a ">" symbol at the left side of the CRT screen, indicating the machine is waiting for the next user to give it some command. He proceeds to type:

>FIND TAXI

and presses the green RETURN *key.*

1 ITEMS FOUND

The machine always responds to a FIND *command by giving the number of items found.*

>PRINT

and again presses the green button. All commands are ended this way.

#1:

TAXI UNLIMITED IS A CO-OPERATIVE TAXICAB AND ANSWERING SERVICE, RUN AND MANAGED BY ITS WORKERS. TRIES TO KEEP RATES AS LOW AS POSSIBLE , HELPS PEOPLE IN EMERGENCIES, AND OFFERS EXTRA SERVICE FOR THE SICK AND DISABLED.
1908 BERKELEY WAY, BERKELEY 94703, TH1-2345

More than one keyword *may be used after a* FIND *command, with the understanding that the items found will each have all the keywords listed – that is, a space between keywords is equivalent to an* AND.

>FIND FREE CLINIC

6 ITEMS FOUND

>AND BERKELEY

The AND *command narrows down the list of items with* FREE *and* CLINIC *as keywords to those that also have* BERKELEY *as a keyword.*

2 ITEMS FOUND

>BRIEF

This command causes the first lines only of the items to be printed out.

#1: GEORGE JACKSON PEOPLE'S FREE MEDICAL RESEARCH HEALTH CLINIC
#2: FREE CLINIC (BERKELEY) 548-2570

>FIND BAGELS

5 ITEMS FOUND

>BRIEF

#1: WHERE CAN I GET DECENT BAGELS IN THE BAY AREA (BERKELEY!)?
#2: THERE IS A STORE CALLED "BAGELS" ABOVE KEY ROUT ST. ON
#3: THE DANISH BAKERY AT UNIVERSITY AND SHATTUCK IN BERKELEY
#4: IF YOU CALL MICHAEL AT 645[redacted] AN EX-BAGEL BAKER CAN TEACH
#5: YOU CAN GET FRESH BAGELS AT THE HOUSE OF BAGELS, WAY OUT ON

>FIND ENERGY CRISIS

6 ITEMS FOUND

>BRIEF

#1: ***** TEG'S 1994 ***** ---> SOME CONCEPTS
#2: I AM LOOKING FOR INFORMATION ABOUT METHANOL (METHYL ALCOHOL)
#3: RESTARTING YOUR CAR'S ENGINE BURNS LESS GASOLINE THAN ONE
#4: <ENERGY PRIMER> -- A BOOK BEING PREPARED BY PORTOLA INSTITUTE
#5: ANYONE WANTING TO DEVELOP PUBLIC-ACCESS INFORMATION SYSTEMS,
#6: GOT TO, GOT TO

>PRINT 6

#6:

GOT TO, GOT TO
GOT TO, GOT TO,
GOT TO SCRAPE THAT ENERGY CRISIS
RIGHT OFF YER SHOES . . . .
(W/THANX TO MICK 'N KEITH)

>FIND DOCTOR BENWAY

3 ITEMS FOUND

>PRINT 2

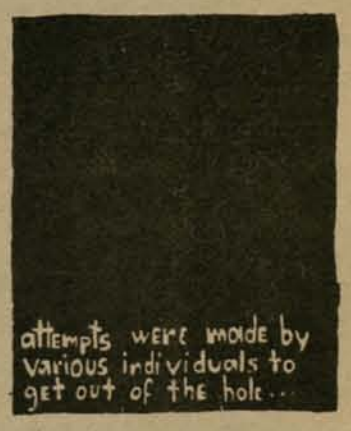
#2:

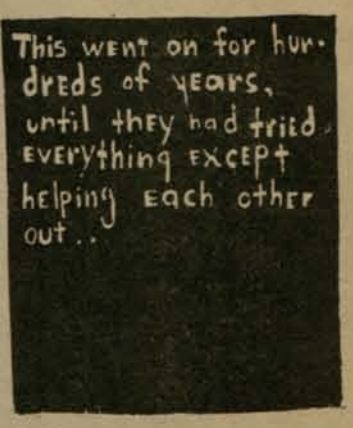
***** IEF XQPRSTQXL SYSPRINT OFFSET INTERRUPT *****
APPLIESTO: ALL BOOGIES, BEANERS, BOLOS & BOZOS .....

DOC BENWAY HERE ..... NURSE, SLIP ME ANOTHER AMPULE OF LAUDANUM ..... RECOLLECT ONCE ME AND CLEM CLONE WAS CHEWIN YOHIMBE BARK OUT BACK OF JODY'S ALL-NIGHT PET SHOP .....

NOT A FINER MAN IN THIS WHOLE ZONE
THAN OL' CLEM 'N JODY CLONE .....

****WHERE WAS WE, YEAH ---- USE AUTHORIZED DATA BASE ACCESS PROTOCOLS ONLY ..... SENSUOUS KEYSTROKES FORBIDDEN ..... DO NOT STRUM THAT 33 LIKE A HAWAIIAN STEEL GUITAR ..... GRAND CONCLAVE OF THE PARTIES OF INTERZONE: CHECK YOUR BOX FOR DETAILS..... PERSONAL ATTENDANCE REQUIRED; SEND NO REPLICA. BENWAY OUT. TLALCLATLAN .....





Keeping Track of the Spies

NACLA, the North American Congress on Latin America, is a political collective that for the past seven years has been researching and publishing information and analysis in pamphlets and a monthly *Report* on the U.S. power structure and its role in Latin America and the rest of the world.

To carry out this work they set up and maintain extensive files of newspaper clippings, magazine articles and other material. The sheer volume of this information — half a dozen newspapers are clipped every day — often makes it a difficult and time-consuming task for a researcher to lay her/his hands on the particular articles that are of interest. The R/O General Information Retrieval System (ROGIRS) offers a possible solution to this problem.

As a pilot project, NACLA selected one of its files, containing material about the CIA. Staff members from both R/O and NACLA read the items in the CIA file (there are several thousand of them) and *descriptorized* them — that is, made a list of categories for each article describing its information.

The descriptors include names of people, organizations and geographical locations, as well as more general categories like "funding" and Watergate. This information along with the title and source of the article, and its NACLA file number, is being entered into the computer using ROGIRS.

Once this is completed, a researcher interested in, say, the involvement of ITT with the CIA in Brazil will be able to go to a computer terminal (one is currently at the NACLA office) and tell the machine to **FIND ITT AND BRAZIL**. The computer would reply by typing a list of all the articles and their file numbers that had both ITT and BRAZIL in their lists of descriptors. New articles can be entered into the system at any time, simply by typing the descriptors, title and file number into a terminal. It is also easy to edit or remove listings.

The data base with this information will be available to other R/O users and publicly accessible from Community Memory facilities. This feature will allow other groups who currently don't have in-depth research libraries to access an extensive file easily. Such groups might include radio stations, legal defense committees and alternative news services.

If this pilot proves useful, other groups in the Bay Area who maintain information files of all kinds will be encouraged to create similar data bases, so that eventually one could find information on, for example, multinational corporations and their subsidiaries, agencies of the city government, welfare procedures, local decision makers, housing or whatever, from any R/O terminal.

In another NACLA project, the Resource One computer is being used to process data on the Chilean corporate elite. The information was collected by a group of Chilean and foreign researchers working at a research institute in Chile. Unfortunately, the coup on September 11 interrupted their research, forcing them to send the data out of Chile to NACLA. The data includes the directors and principal stockowners of the 100 largest Chilean corporations, American subsidiaries, and major banks and other financial institutions. The study should help reveal the interconnections within the corporate structure and help in understanding the American interest in and response to events in Chile over the past several years.

COMPUTERIZED MAILING LISTS

NIMS, the New Interactive Mailing System, is a user-oriented program that provides groups who have large mailing lists with computer printed labels. Interactive means that the system is used from a computer terminal with the user telling the program what he wants to do, *e.g.* add new names, change an entry, sort the list, etc. NIMS allows the user to assign his own categories to the people on the list and will select and print labels for a given category as well as for the whole list. This makes it easy to prepare special mailings for different parts of the master list. The categories used by each group are different, but include things like: contributor, special interests, and occupation. The program will also print listings on paper, with several "comment lines" (lines not printed on labels, *e.g.*, phone number, date they were put on mailing list or whatever) allowed after each name. Both listings and labels are available sorted either by last name or by zip code. For the time being we are limiting ouselves to lists of under 20,000 names, although the program was designed to handle up to 60,000.

We are offering this service partly because we recognize that it can save people a lot of the drudgework of hand addressing envelops, but also as a way of introducing groups who we feel could make more powerful use of the computer to some of the basic skills and techniques involved.

If Resource One is not now on your mailing list, please put us on it. We will make an effort to keep up with the activities of all groups corresponding regularly with us, and make this information publicly available through Community Memory.

LEGAL INFORMATION RETRIEVAL SYSTEM

The San Francisco Neighborhood Legal Assistance Foundation (SFNLAF) and Resource One are jointly developing a legal information data bank to eliminate one of SFNLAF's greatest enemies: duplicated research.

SFNLAF has six offices in San Francisco, providing legal help to clients who can't afford commercial legal services. They handle roughly 1200 clients per month, involving primarily landlord-tenant, welfare, immigration, and civil-rights law. many of these cases require time-consuming research prior to preparation of arguments and briefs. Due to the lack of an effective method for exchanging information among various attorneys and separated offices, much of this research is repeated in case after case.

Resource One is developing an information exchange system, using ROGIRS to link the six SFNLAF offices together via terminals in each office which can simultaneously reference the legal data. Each attorney, as part of her regular case-reporting procedure, will compose a paragraph describing the case in brief, including a source for further information. This paragraph is then stored in the computer under several "keyword" descriptors, selected to include the areas of law involved and names of judges, attorneys, and clients.

An attorney with a new case to research can easily instruct ROGIRS to list the summaries of cases similar to his, selected by area of law, judge, etc. By referring to the briefs and arguments written for these cases, the attorney has access to research already done by others.

The data bank will also contain skills and referral information. Most members of SFNLAF, and their outside contacts, will be listed in the data bank under their particular specialties, so that an attorney needing expert help will know where to go. In many cases, SFNLAF's clients' problems are not strictly legal, but spring instead from police relations, community organizing, tax questions, etc. As members of SFNLAF encounter other organizations and individuals who may be of use to SFNLAF's clients, they will be added to the data bank for future referrals.

As a seperate project, SFNLAF is using Resource One's computer to process their "client intake" forms, to produce a better over-all picture of their clients' needs and their own success in meeting those needs. Both this and the legal information data bank are designed to save SFNLAF's attorneys much time and effort, allowing them to handle cases more efficiently and with more personal contact.

With a Little Help From Our Friends

Running a community computer center is expensive!!

So far Resource One has depended largely on foundation grants for our support, but this source is neither permanent nor dependable. Ideally, we would like to be funded by the people and organizations we serve, but many of them can't afford enough to offset our expenses. Therefore we are appealing to everybody who thinks that the kinds of projects described in this newsletter are worth-while to help support them. No contribution is too small!

Enclosed is my contribution of $_____
to be used to help support the: _____ project
(All contributions to Resource One are tax-deductable)

Please put me on the Resource One mailing list:

Name: _____

Address: _____

_____
zip code

Mail to: Resource One, 1380 Howard St., San Francisco, Ca. 94103

We would also like to hear from you if you have any feedback on what we're doing, our ideas and plans, or if you're involved in a similar or complimentary project or know of any.

Helping Out Food Conspiracies

As the distribution of goods has become increasingly centralized, institutionalized, and profit-oriented, a number of alternative forms have appeared. One of these, the food conspiracy, extends the basic cooperative idea to trade our most ancient basic commodity, *food*, for our most modern commodity, *time*. Its members take on the tasks of collating orders, finding farmers, manufacturers or distributors, buying, loading, hauling and sorting the food — all the tasks that the supermarket shopper pays someone else to perform.

The information load in such a distribution system is considerably heavier than in the usual marketing system, and few groups have been able to handle expansion to a level where they are able to negotiate for discounts and rebates that are available to large corporate distributors. Assuming that excellent communication for coordinating large distribution efforts is possible without large and efficient hierarchical organizations, it should be possible to extend the conspiracies to include more people who need really cheap food without alienating the people who simply enjoy working together and want to see where their food is coming from.

Since the order-processing and bookkeeping jobs are the least fun of all, the most error-prone, and a general bottleneck, Resource One is developing a program to deal with some of these jobs. Based on an analysis of methods used by a number of functioning food conspiracies in Berkeley, the program will accept orders, price corrections, and accounting information, and will process and print out information in a usable form for the buyers, truckers, sorters, etc. — as well as keeping records important for group decision-making.

This program will be tested on the block level sometime during April or May, and hopefully will be available for others who want to use it shortly thereafter.

A Bit of Ancient History

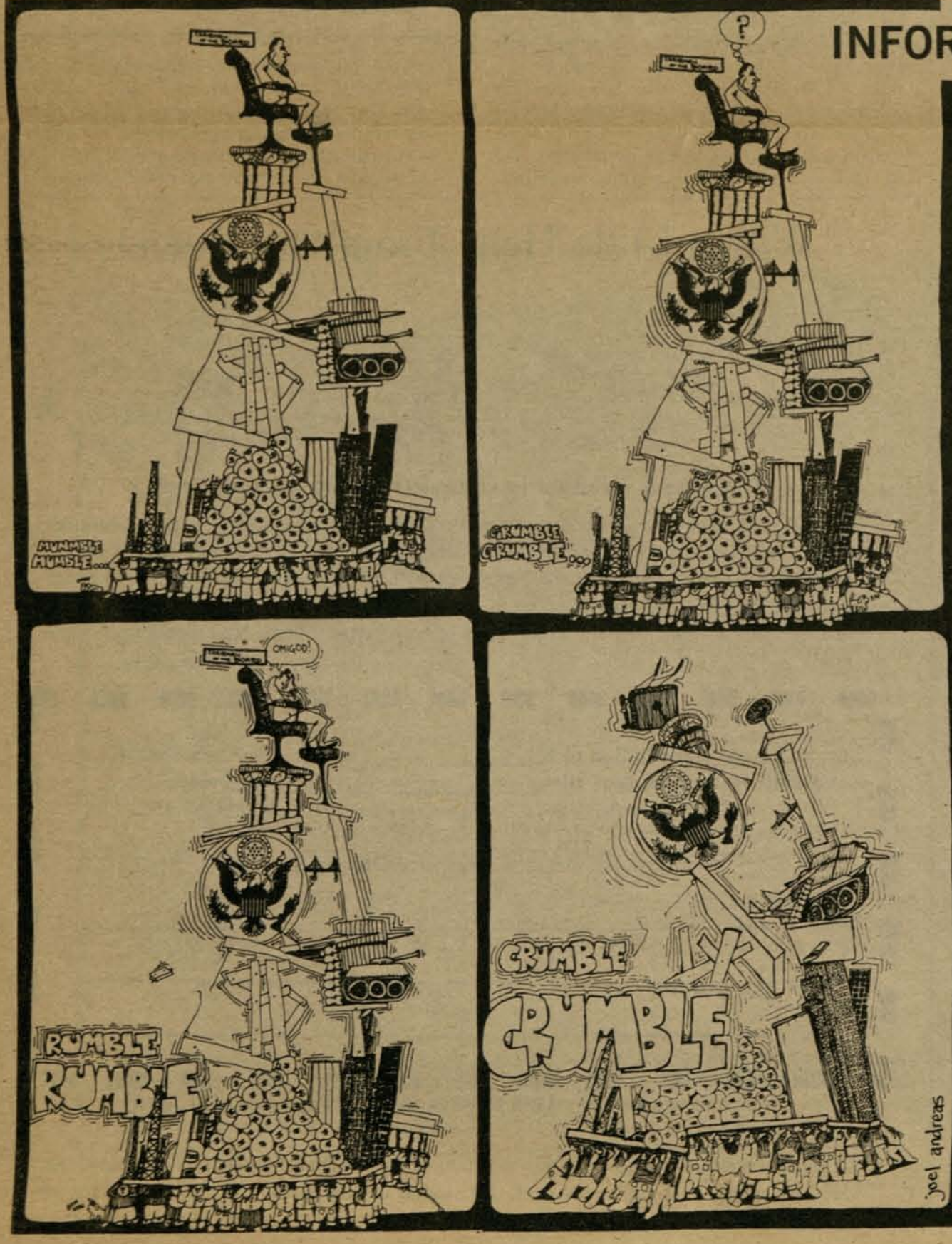
Resource One's roots go back to U.C. Berkeley during the Cambodia crisis of May 1970. A group of computer people there got together, like others, and talked of their disenchantment with how their skills were destined for use in "the system". They fantasized about using computers for building communication networks to share information and resources. Several months later some of the students were attracted to Project One in San Francisco, where other technologically oriented people, as well as artists and ex-professionals of all types, were gathering to try out a new concept of integrating their skills and work with the rest of their lives.

Project One (or 'ONE') was a vacant 5-story warehouse building in downtown S.F.—84,000 square feet of bare, cold concrete, which has since been transformed into an imaginative warren of 'spaces' in which 60 people live and twice as many work on a wide variety of projects. Besides Resource One there now are: an experimental high school, music and radio recording/practice studios, a film processing lab, theater rehearsal space, an alternative magazine, a radical welfare department workers' union, and numerous artists, musicians and craft people.

Resource One came into formal existence in late 1971, when the small group of ex-computer science students obtained seed funding from the Stern Foundation, and a commitment from Transamerica Computer Corporation for an XDS-940 timeshare computer.

The computer arrived, newly refurbished, in early 1972, and was installed in its own home built room in June of that year. In July the "operating system" (the main program) was put into operation, with the donated help of some of the people who five years before had written the first such time-sharing programs.

Funding for the first year of operation was secured in October of 1972, with the last matching grant from a series of foundations, including the Bank of America Foundation, San Francisco Foundation, the Zellerbach Family Fund, and the Firemen's Fund Foundation. Shortly afterward, the Irvine Foundation donated the cost of our mass-storage disc file. What we have done since then is what the rest of this newsletter is about.



INFORMATION AS POWER

Perhaps the dominant aspect of life in America today is a feeling of helplessness, a lack of control over our own lives. What little confused information there is about what caused the 'energy crisis', about U.S. involvement in the Chilean coup, or about the 'redevelopment' of the Mission District with the coming of BART, demonstrates that the decisions which affect our lives are not being made in our interest, but rather in the interest of a small group of rich, powerful men and the huge corporations they represent.

It is no accident that there is so little information about such important questions. Both the quantity and content of available information is set by centralized institutions — the press, TV, radio, news services, think-tanks, government agencies, schools and universities — which are controlled by the same interests which control the rest of the economy. By keeping information flowing from the top down, they keep us isolated from each other.

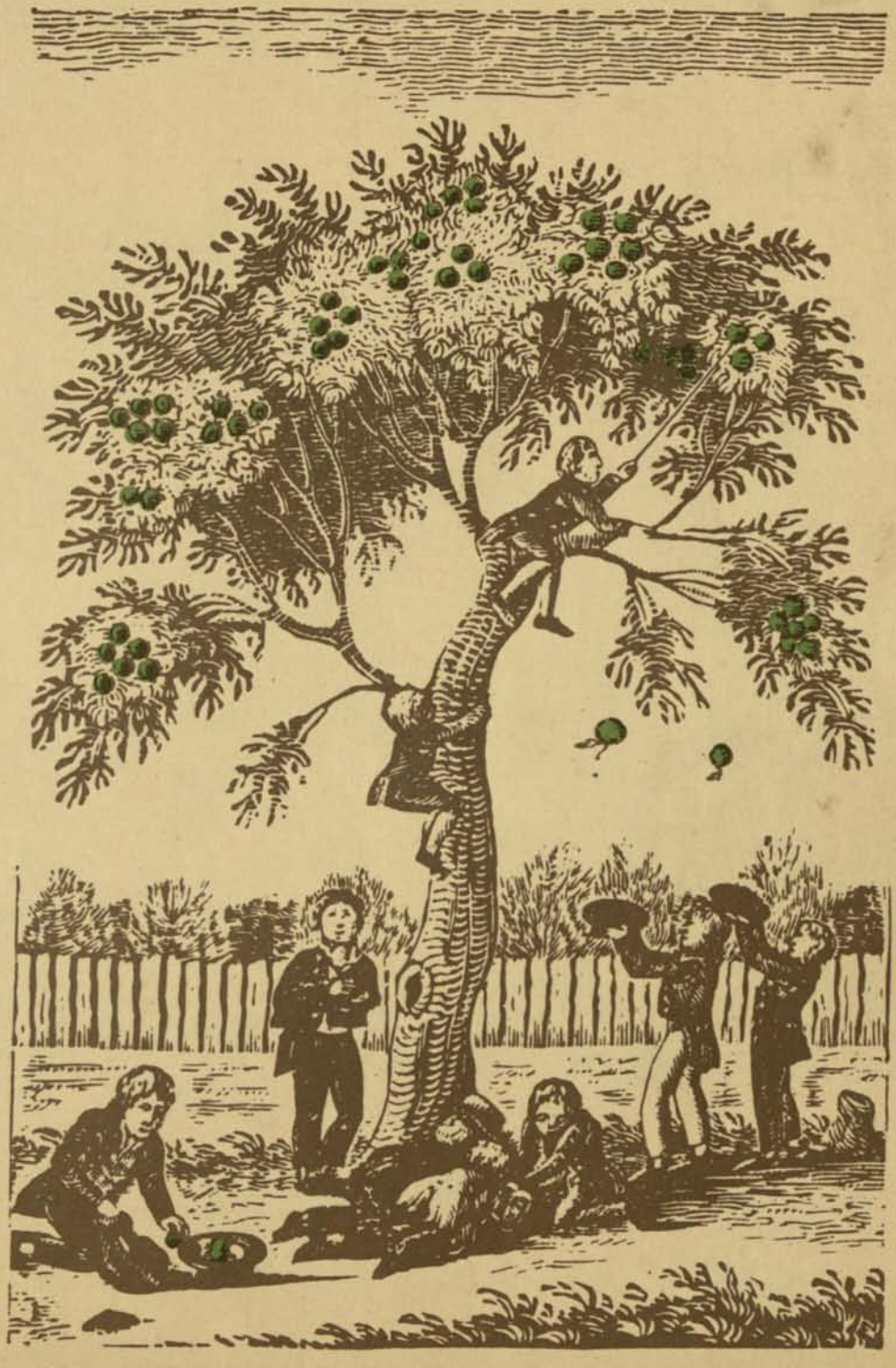
Yet we are not really powerless — our strength lies in the creativity of people seeking solutions to their own life problems. Free schools, free health clinics, the women's movement, third world movements, the prison movement, the GI movement, tenant's unions, food conspiracies, rural communes, in a thousand ways people are trying to gain direct control over their lives. The reponse of the capitalist system to these struggles is remarkably consistent: where the threat is not too great, coopt and absorb it; otherwise isolate and repress it. It is this pattern that convinces us that control over the flow of information is so crucial.

Computer technology has thus far been used in this fight mainly by the government, and those it represents, to store and quickly retrieve vast amounts of information about huge numbers of people — everything from their arrest records and credit ratings to reports of their personal lives. A few years ago it was estimated that the FBI alone was maintaining computerized files on the activities of over 2 million Americans, and the Associated Credit Bureaus of America had data on over 100 million people.

Computer technology, though, is just a tool and can be shaped by those who use it. The challenge that we at Resource One are faced with is to figure out how to use this tool to support the struggles we believe in, to make information available to the people it affects, to allow groups to easily communicate with each other and share their skills, resources, ideas and experience.

RESOURCE ONE

TECHNOLOGY FOR THE PEOPLE



A NON-PROFIT COMMUNITY GROUP SHARING INFORMATION AND SKILLS

RESOURCE ONE

is a non-profit community group, engaged in bringing technology to the people.

We help answer questions like these:

HOW do you, as a researcher,

- organize your files to find information quickly?
- find out if other researchers have relevant information to share?

HOW do you, as a clinic worker,

- pinpoint the health problems of your community?
- analyze the effectiveness of your services?

HOW do you, as an ordinary person, find out

- who makes decisions affecting your community?
- how different social service agencies deal with specific problems?
- who in your community will trade something you need for your old electric guitar?

RESOURCE·ONE has a large donated time-sharing computer. We got it and other tools together to help people who have never before had a chance to use sophisticated technology.

In the right hands, technology *CAN* be used for the benefit of people. By promoting the sharing of resources and useful information among people with common interests, computers can help build stronger communities.

COMMUNICATIONS TOOLS

RESOURCE · ONE'S primary tool is our XDS-940 timesharing computer system – a big, fast machine capable of communicating with up to 24 users at once, either directly or via data terminals connected by telephone. (A data terminal is used like a typewriter – what you type is transmitted to the computer, and the response appears in front of you.)

Also attached to the computer are a high-speed line printer, a magnetic disc unit (for storing up to 50 million characters of information), and two magnetic tape drives for convenient permanent storage.

We also have videotape equipment for educational use. And in our electronics shop, we are designing and building low-cost communications tools for community use.

AN INVITATION

If your project involves substantial information handling, and is aimed at building stronger communities, please come talk to us about how Resource One can contribute.

We are located on the first floor of ONE, the warehouse community in the South-of-Market district. Write or call:

RESOURCE ONE
1380 Howard Street
San Francisco CA 94103

Telephone: (415) 864-8663

DESIGN: LIBERMAN-12-73 // WOODCUTS: BEWICK // LEVITATION · GRAPHICS · 849-3202

eddies

number 3 November 1972

"It's so cheap to 'phone your friends...."

THE TELEPHONE ripoff game is growing. Ripping off the Post Office has been a common pastime in UK universities and schools for several years, but only in the last nine months has the game reached Sunday Supplement status.

Here are some of the latest developments

Hardware. In June, Ramparts magazine (2054, University Ave., Berkeley, California 94704) published instructions on building a so-called "mute box". A mute box allows its owner to receive calls which are not charged to the caller. It uses just a capacitor, a resistor and a couple of switches, and it's said to work fine over here too. Complete instructions on how to build one have been circulating in an anonymously-printed pamphlet for the last couple of months. And although the Special Branch are reliably reported to be taking an unhealthy interest in suppressing the pamphlet's circulation, it should not be difficult for the eager would-be phreak to get hold of one.

The Sunday Times published an article on phreaking on October 15. The article was not overly informative, but it did point out that to build the British equivalent of an American "blue box" is incredibly simple. All that's needed is to make an oscillator that produces a stable 2280Hz tone, and a method of producing pulses of that tone. The pulses must correspond to the break periods between the voltage pulses normally produced by a dial telephone, and must be 40 to 70 milliseconds in length. An ordinary dial from a telephone can be used to produce such pulses, of course, although it's less accurate and more suspicious-looking to a casual onlooker than an electronic, pushbutton pulsing system.

Software. "Blue boxes" give access to the STD system, and allow the phreak to dial all sorts of interesting places. The trouble is knowing how to get there, however. The problem is to figure out what series of digits will get where. What's the code to dial from London to Afghanistan? Is there a code for gaining access to computer time-sharing systems? Are there diallable codes that allow conference calls to be set up? The system of codes used by the Post Office and the International telephone corporations can only be discovered by leaks from the inside, or by compulsive trial and error. About the only way you can find out about it -- unless you're a compulsive dialler yourself -- is to find yourself a friendly phone phreak or telephone company employee. You'll have more luck with the former than the latter.

and Politics. Seventeen people were busted on October 7 on charges of "illegal abstraction of electricity involving the telephone system" according to the Daily Telegraph. Some people busted in Oxford on similar charges earler this year were hit with two and three hundred pound fines. Even greater fines were imposed in November in Bristol.

The Post Office engineers and security boys are clearly annoyed that these upstarts are bugging up their perfect technology. Yet they admit (see the Sunday Times article, for instance) that there's no sound reason for it. It's not as if the phreaks are draining huge resources out of the telephone systems of the world -- they typically operate out of peak periods, so they have next-to-no detrimental effect on the system. No, it's the principle of the thing. Can't have people messing around with OUR technology. Who are they, these outsiders, anyway? Whadathey want, free communications for everyone, or something? Whadathey think technology is, anyway, a plaything, something to have fun with?

BARGAIN OFFER!

EDDIES will be appearing monthly from now on, sent by first-class or air mail to UNDERCURRENTS subscribers only. You can still buy UNDERCURRENTS on its own, of course, at 25p, plus postage. But to keep up with everything that's happening in radical science and technology, a year's sub is a far better bet. It's a giveaway at £1.80 (£2.00 overseas). Take one out now.

The letter the SUNDAY TIMES wouldn't publish

ON OCTOBER 1, the "Sunday Times" carried an article titled "The Chances of a Nuclear Hijacking", in which an article in the last issue of UNDERCURRENTS — "Towards a Peoples' Bomb" by Pat Coyne— was quoted in support of the contention that it would be possible for a guerilla group to make its own A-bombs using hijacked plutonium. A similar article appeared in the London "Evening Standard" a couple of weeks previously, and apparently the story found its way into some papers in the USA.

While we're flattered by all this attention, it seemed wise to set the record straight by giving our reasons for publishing the Bomb article, so we sent a letter to the Sunday Times. So did Pat Coyne. But neither was published, though we know they were received. To put at least our own readers in the picture, here is the exact text of the letter to the "Sunday Times".

The Editor
Sunday Times,
Grays Inn Road,
London WC1 6th October 1972

Dear Sir,

The article by Paul Eddy and Bryan Silcock in Last week's Sunday Times may have given readers the impression that UNDERCURRENTS magazine is in favour of the construction and use of home-made A-bombs by political revolutionaries.

I should like to make it clear that UNDERCURRENTS is totally opposed to the construction and use of nuclear weapons by anyone -- and since the sole purveyors of such devices are, at the moment, the Governments of the big five nuclear powers, it is on these institutions that UNDERCURRENTS concentrates its opposition.

The super-powers have used the ritual threat of nuclear annihilation to preserve the existing power structure and economic balance within their countries, and to stave off any chnages in the status-quo within other countries which might affect their economic interests.

Their power to do so without challenge on their monompoly of nuclear knowhow.

But no monopoly can ever remain entirely unbroken.

The UNDERCURRENTS article by Pat Coyne (not a pseudonym, incidentally) begins with the axiom that "any self-confessed revolutionary is a student of irony", and the purpose of the article was to highlight the supreme irony that the Governments of the major powers, having unleashed the forces of the atom to provide themselves with seemingly-unlimited powers for social and economic control, should now find themselves faced with the prospect of having their own super-weapon turned against them.

Far from advocating the actual use of nuclear weapons by revolutionaries, however, Mr Coyne advises against it—"my advice is, don't bother." (What he does suggest, though, is the possibility that a revolutionary group might pretend to have made a bomb using hijacked plutonium, as a tactic of propaganda).

Your article on "The Chances of a Nuclear Hijacking" concentrated on the danger of supplies of plutonium getting into the "wrong hands".

UNDERCURRENTS believes that plutonium is already in the wrong hands -- those of the governments of the nuclear powers.

Having used the contents of Pandora's Box for their own selfish purposes, they can hardly be surprised if others seek to do likewise .

Sincerely.....

KILLING — isn't it?

"FOR THE first time since the early sixties it's possible to make real money out of property..... Someone is going to make a killing out of all this, and it might as well be you."

Just two quotes from one of the most nauseating sales letters we've seen for years, sent out by Stoneh Publications Limited of 2 Jarrow Road, Chadwell Heath, Romford, Essex, the appropriately-named proprietors of the "London Property Letter." Edited by one Robert Troop, property correspondent of our favourite newspaper, the "Sunda Times", the LPL (as it is affectionately known among developers) exists to give confidential advice "both for the expert developer and the small man who wants to get in now and produce a useful private income for himself."

In sharp contrast to the current Conservative "concern" over rising prices and spiralling inflation, the LPL is positively enthusiastic when it points out that " Since the Tories returned to power ... house prices have boomed as never before ... office development restrictions have been shot away. Birmingham has become a capital place to operate in ... And Leeds and Bristol are following fast ... Landlords have started to cash in on the new bedsitter boom ... Converting properties of every type to flats has become a big business ... And the biggest bonanza of all may well be our entry to Europe."

Still, as you huddle overy your gas ring in your £9 a week one-room bedsit, it's consoling to know that somewhere out there someone's making a "killing" out of you.

LOW IMPACT TECHNOLOGY

This new outfit's aim is to make information and hardware available to people who want to use "alternative", enviromentally acceptable technology.
Run by Andrew MacKillop & Peter Bunyard, LIT will be strongly-based in Cornwall, with a research/demonstration site at Lawellin farm, Withiel and offices at Wadebridge.
Andrew MacKillop writes:
"We are still puting information, plans, contacts and so on together ---- so some areas such as good, cheap windmills, may take some time before we can offer really good ones, of proven quality. Right now we are getting some Clivuses, and soil cement block rams. The Clivius is a Swedish patented aerobic compost maker that you instal in your basement and connect to the lavatory and kitchen waste hatch. it composts all organic wastes, and after one year or so it can be emptied of some compost. There are some problems in using it -- especially keeping the base warm; both these can be got around by good construction and insulation. On a new house, it is cheaper than pollutive, wasteful, cess pits, and handymen should be able to fit it to most existing units. Otherwise, its expensive to instal.
Soil-cement rams are for people who want to build their own housing. One type costs abiut £175 delivered, and the other csts about £100. Both give blocks as strong as many bricks, from 90% earth and 10% cement . If your buying bricks retail they'll usually be around 3p each, and a small house needs 16,000. For a few houses built together -- the easiest way is through a self-build housing association -- soil-cement rams are the easiest & cheapest method.
Other areas include solar collectors, water turbines, wheels, tools, horse-drawn equipment and so on. Often these come from small firms with low turnover and high profit levels. We are urgently looking for people and manufacturers who can produce needs hardware at sane prices. For instance, UK manufactured turbines rarely cost less than £3,500 for a 1KW unit -- at that price it is obvious that few will be interested. Our approach here is to find a sympathetic manufacturer who can put turbines together for under £250 for 1KW, and also to find people who will travel, build and instal a unit for people who want to use them. This also applies to solar collectors, where the present price is over £2.50 per sq ft, which means over £800 for a reasonably-sized solar heating installation. We think we can get this down to £400 or less. We have a special interest in helping to DIY. We are getting useful plans and details of plant together, with the sources of ancilliary gear, tools, etc....
We hope we can help, eventually in everything from housebuilding and energy production right through to food production, metal working, weaving & so on. Veneremos!

RADIO LIBERTY

Radio piracy, traditionally confined to the medium wave where daytime broadcasts are limited to line-of-sight range and night time transmissions are overwhelmed by a babel of European interference, has taken to the short wave in search of national and international audiences. Most prominent among the short-wave pirates is Radio Liberty, which broadcasts on 6.815 MHz (about 43 metres) on Sunday mornings from 10am onwards. Transmissions started on June 25 this year, and are carried out from a location which "for security reasons must be kept secret." Even though the transmitter is a low-power, 30W model, the station says it gets reports of very strong signals from all over the British Isles. Apart from Radio Liberty, short wave sleuths report a considerable number of assorted pirates on 6.3 MHz (around 44 metrs). But to pick up these stations, you'll need a reasonably good communications receiver, a fair aerial, and a bit of luck, since short wave communication can be pretty unreliable. And if you're in search of a homespun but genuine alternative to the straight radio networks, you'll have to listen hard.
So-called 'free radio' consists at the moment almost entirely of juvenile imitations of Radio One DJ shows, interspersed with reminiscences about the Golden Age of pirate radio in the 60's -- the age when Radio Caroline (now revived, we see) brought British radio to the people, and crusading knights like Ronan [illegible] O'Rahilly (now in hippy-style flowing beard and robes, we see) battled bravely to liberate the airwaves, mindless of personal fame or profit.
But the banality of most pirate programmes is probably due to the political and cultural naivete of the average radio freak, rather than to a conscious policy of commercialism. Another important factor is the sheer lack of material to broadcast. So if you'd like an unusual but effective medium for what you've got to say, you could do worse than contact your friendly neighbourhood radio freak: he probably broadcasts his address on air. Radio Liberty is at Box 41, Coldershaw Rd., West Ealing, London W13 9DX.

RESEARCH INTO ACAUSAL PRINCIPLES

A long-term project to investigate "acausal principles" has been started by Centre-Periphery Models, the Camden-based "radical cross-media/info/research group".

CPM have chosen the term "acausal principles" rather than conventional phrases like "psi", "ESP" or "parapsychology" because they believe that any research into the ESP field today must take account of the cross-fertilising and interdisciplinary process within many fields of science and the arts.

The group says its research programme will be open-ended, and will occupy several members in book, field and practical research . Intermittent research reports will be issued, either in the group's own publications or in press articles.

CPM have just moved into new premises at 11, Winchester Mews, London NW3, courtesy of Camden Council.

They hope the new premises will be the venue for informal seminars where interested - "or simply curious"- outsiders can gain access to current information, or stimulate feedback.

The group's members plan to gather material in the form of taped interviews with parapsychologists, sensitives, hypnotists and others directly involved in the field, in an attempt to evolve an information system comprising books, articles and transcripts.

"Subsequently," say CPM," we would like to develop a parapsychological education project involving young people, hopefully using an audio-visual system.

"In immediate terms, however, we shall investigate two areas of enquiry -- the possible relationship between certain forms of schizophrenia and psychic phenomena such as clairvoyance and clairaudience; and the possibility of enhanced psi receptivity among parents and very young children, using control groups of five or ten parties in each case."

Among the fascinating current developments in ESP, the group says it would like to investigate two -- "Konstantin Raudive's extraordinary findings concerned with 'electronic communication with the dead using tape recorder and diode (a review of Raudive's book will appear in the next UNDERCURRENTS--Ed), and Ted Serios' alleged psycho-kinetic powers, in which he claims to imprint images on blank film by a form of psychokinesis."

"ALTERNATIVE SOCIETIES"

This is the title of a new course at Cambridge, which will be an option for students of Social and Political Science. The course will look at "alternative societies throughout the world, their structure, their political implications, and their use of alternative technology."

Martin Richards and the other people behind the course are not really sure what direction it will take, but they will be writing to UNDERCURRENTS to tell us how things are going.

Martin, and John Frazer of the Universitys Department of Architecture, are planning to get the students building something, so the course shouldn't be too theoretical anyway.

TOWARDS SURVIVAL

Towards Survival is a new monthly magazine based on environmental considerations, but ranging into economics, politics and a lot more. Format-wise, the journal consists of 20 to 30 duplicated sheets. There are sections on Survival Politics and Strategies, Energy Production, Intermediate Technologies, Employment Policies, and many other subjects.

TS seems very good value at only 10p per copy. Don't dismiss it as "yet another small publication": as its editor, Keith Hudson, explained to us," some people deplore all the variety of movements, publications and so forth, all doing their itsy-bitsy creative thing, but it's heading to a logical focus somewhere in the future. I firmly believe this, and I'm confirmed in my belief every day by what the post brings me."

Towards Survival emerges on the 15th of each month from 79, Sutton Avenue, Eastern Green, Coventry CV5 7ER.

A COMPUTER FOR THE PEOPLE

The "Galdor Centre" is the name of a shop in South London from which some radical computer people are planning to operate the old ICL 1301A they got from London University last year. "There should be little difficulty, they say," in reinstating it to its original condition," thanks to careful mothballing and regular inspection, plus some spare parts from another old machine. Planning permission to erect a steel and asbestos building (behind the shop) to house the computer has been obtained. The 1301A is a second generation machine with 13 microsecond execution time, 1200x48-bit words of core plus 12,000 words on drum and 4 tape handlers, a 600lpm printer, a 300cpm card reader and a 100cpm card punch . A radio link will hook all this up to Croydon Astronomical Society's observatory at Kenley, for computer-assisted observation.. And "school and research groups, and individuals, can come and develop ideas in a friendly atmosphere." Contact Stuart Fyfe, 52 Brighton Road, Surrey. 01 399 1300

(Real Time)

eddies small ads page

SMALL ADS INFORMATION

Cost: Up to 50 words, 50p per ad, flat rate. Over 50 words by arrangement.

To place Ads: Book through the office at 34, Cholmley Gardens, Aldred Road, LONDON NW6.

Free Ads: Yes, to deserving causes, which means things like offers of help, charities, free services .....

UNDERCURRENTS reserves the right to change or reject Ads if necessary

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ALTERNATIVE WORK. UNCAREERS is about work which is done for its own sake , and controlled by the people doing it. This means things like cooperative workshops and community projects . UNCAREERS produces an excellent "Directory of Alternative Work" -- listing and describing projects which , although at a survival level paywise, offer an escape from drudgery. There might be something that agrees with you in UNCAREERS. Price20p from 298b Pershore Road, Birmingham 5. For further details, write or ring 021 440 4146.

RADICAL TECHNOLOGISTS Robin Fielder and Dave Hayes are looking for people with some technical experience to help initiate collective production. Write to them at 71, Thirlwell Road, Sheffield S8 9TF.

NOT YET COMMITTED? Room for one more financially stable person in alternative ecology/publishing/craft/ truck store (residential) and research project. Enquiries: Moonfleet, c/o 130, St Alphonsus Rd., Clapham, SW4.

HELP". To continuesoil ecology work, but not be attached to establishment, I require a 50x bino microscope. Would buy very cheaply, or make . Any plans/ideas? RCC., Vicarage, Hastingleigh, Ashford, Kent.

ALTERNATIVE TRAVEL GUIDE. "Overland to India and Beyond," is a new BIT publication with details on visas, health, border checks, food, the "black market, shelter, travel and lots more covering every inch of route from Istanbul to Indonesia. Includes BIT's complete European address network. Minimum donation 50p, but 75p would be very nice! From BIT Free Information Service, 141, Westbourne Park Road, LONDON W11. (PS What can BIT do for you? They say they're prepared to tackle almost anything. Ring 01 229 8219, or write.

SCIENCE FOR PEOPLE, the new magazine from the British Society for Social Responsibility in Science, is now on sale at 15p a copy. From BSSRS, 9 Poland Street, London W1, bi-monthly.

COMMONWEAL COLLECTION is a free postal library designed for those who are concerned with the problems of peace and the creation of a non-violent world. They have a very full collection of the works of Ghandi and Ghandian literature. The library is entirely dependent on voluntary help and on gifts of money and books. An Author Index (12p with supplements 4p each) is available from David Hoggett, the librarian, at 112, Winchcombe Street, Cheltenham, GL52 2NW. New publications to add to the collection would be most gratefully received.

BIKE POWER. "Committment", published by Chris of 26, Grosvenor Road, St Albans, Herts, is a bike information sheet. It has information on bike-ins and pedal freakery in general. Well worth reading.

WANT TO MAKE SOME MONEY? Why not sell UNDERCURRENTS in your spare time. We sell you copies at 1/3 off, and buy back any you don't sell. Contact us for further details, at the address above.

AND REMEMBER, NOT ONLY is UNDERCURRENTS read in colleges, universities, laboratories, schools, hospitals, mountain huts, communes, factories, polytechnics, teaching establishments, rowing boats, potting sheds, advertising agencies, prisons, police stations, fire stations, ambulance stations, railway stations, penthouses, bedsits, lifts, skyscrapers and gliders, BUT ALSO in submarines, jumbo jets, the Pentagon, offices of the Sunday Times, swimming pools, on Glastonbury Tor, in Geodesic domes and at the British Museum. (further suggestions must be accompanied by an Arab-postmarked letter bomb, addressed to John Prudhoe, who thought up this ridiculous list in the first place ... Ed)

THE LEA

I live near the Lea Valley, by Lesney Matchbox Toys factory. I sometimes go there in the evening about 5pm. It is said that part of the Lea is clean. It is not. Fishes are dying in hundreds and hundreds.
I caught a fish; it had no eyeballs, no tail. That is only one. All that is done by us. Mostly by the factories that dump oil in the Lea. We can't help the sticks that get in the Lea from the trees.
We couldn't swim in the Lea, the way it is dirty. The dirt in the Lea pulls you under then the river weeds keep you under. Why? Humans trying to be modern, catching up with new cars. Which is called development of the modern world. VIVIAN USHERWOOD
(Vivian is 12 years old and goes to school in Hackney)

IRELAND – mining other peoples' business

UNTIL THE mid-1950s, attitudes to mining in Ireland were dominated by two myths inherited from the colonial era: that Ireland had no minerals; and that Irishmen would be incapable of working them in any case.

But ever since 1958, after mineral strikes at Tynagh, Silvermines, Gortdrum, Navan and elsewhere, nearly 10 million tons of lead, zinc, copper and silver have been mined in Ireland. The country now has the largest producing lead and silver mines in Europe, the fifth largest mercury mine in the world, substantial deposits of barytes, and the likelihood of further large-scale mineral discoveries.

The first myth has now been shattered. "Irish Mining: the Case for Action", the first in a series of pamphlets produced by the Resources Study Group, based in Trinity College, Dublin, records how the recent upsurge in mining activity took place.

By the 1920s, it seems, such coal and iron mining as had been carried out -- mostly by imported English labour -- had petered out almost completely.

The Irish government did not begin systematic exploration until 1947. This produced a copper find at Avoca, but after various misadventures , including government subsidies of £2.5 million, production ceased in 1962.

Not until the strike by Northgate Exploration at Tynagh in 1961, and the subsequent massive strikes by Tara Exploration at Navan in 1970 and by Syngenore Exploration at Ballinalack, was the fact that Ireland is a minerally rich country confirmed.

In the 16 months that followed the first drillings at Navan, Tara (an associate of Northgate) removed enough lead/zinc ore to put the mine at the top of the world zinc- lead mining league.

The second myth, that Irishmen are not capable of exploiting their own country's mineral wealth, has been perpetuated rather than shattered by the recent spate of discoveries, however.

All the companies mentioned above are Canadian-owned. Their profits, which from the working of present ore reserves should reach £250 to £300 million by the mid-1980s, can be repatriated without restriction. Under present Irish law, they will not even be taxed, since the Irish government enacted a 20-year tax exemption on mining profits in 1967, as part of a series of industrial incentives to foreign investment.

The Resource Study Group's conclusion, set forth in detail in its first pamphlet and in its latest study, "Navan and Irish Mining", is that Ireland should nationalise her foreign mining enclave, without compensation and replace it with a state-run mining corporation operating, as far as possible, in the underdeveloped areas -- such as the Irish-speaking Gaeltacht region, in the West. This is a bold formula for nationalist emancipation. But in the light of current government thinking in Ireland, where state enterprise is regarded as subsidiary to and in support of the private sector, it is politically unrealistic.

One of the group's most telling slogans is "Chile took it back-- so will Ireland". Unfortunately, unless Ireland can produce a Salvador Allende to revolutionise the present ultra-capitalist regime, the only realistic hope is that the present tax exemption on mining will be reviewed.

At the moment, the only charge mining companies pay on their profits is an exploration royalty of 9%. A 20-yeat exemption is totally inappropriate to the mining business -- the existing ore reserves will be exhausted well before the end of the period.

Where this latest pamphlet, together with the previous one, scores most strongly is in the background information i provides. No battle can be started, let alone won, without a thorough understanding of the enemy's actions and motives. And by providing what it calls " a massive indictment of those who legislate in the name of the Irish people", the group has succeeded admirably in laying the foundations on which the fight to end the exploitation of the Irish people can ultimately succeed.

BRIAN O'CONNOR and ANT STOLL

"Irish Mining - the Case for Action", and "Navan and Irish Mining" can be ordered from RSG at 27, Harcourt Street, Dublin 2, or from AgitProp, 248 Bethnal Green Road, London E2. Price 20p and 30p respectively, plus postage.

Grovel... grovel!

THERE'S A mistake on the cover of this issue of UNDERCURRENTS. The subscription price is quoted as £1.50, and the correct figure is £2.00 for overseas subscribers and £1.80 in the UK.

The reason for the discrepancy is that we decided, after typesetting the cover, that Britain's second class postal service, and the overseas surface mail services, are no way to send out a publication that purports to contain news. We also decided to mail the new "Eddies" separately, instead of enclosing 4 of the 12 issues with UNDERCURRENTS, for much the same reasons. Air mail and 1st class post cost more. So ..... Sorry!

RADICAL TECHNOLOGISTS: Workers' Control in an Urban Community

We are looking for a handful of people with scientific, technological or technical experience to initiate a collective project in production. The 'factory' or workshop will be directly linked with shared accomodation. We already have the beginnings of such premises in a large northern city.

A number of different strands have converged to make us want to do this, and we think that a number of different types of people will find they are already thinking on some or all of the same ways.

Radical Scientists

Scientists and technicians are beginning to react critically against the white-coated roles for which they have been educated. They no longer see science in its present social context as the unambiguous "answer" to human and economic problems; science is no longer self-evidently "neutral". Many of the jobs they are qualified to enter involve tasks which are repugnant to them, for instance in defence, or in those consumer products which they see as socially useless and maybe have adverse long-term enviromental effects. More recently people have found that the higher their technical qualifications the less openings are available to them. Industry does not need all the scientists that are being churned out, and many of those that do find jobs are being dispensed with by the time they are 35 to 40. Graduate unemployment has radicalised not only arts students, but also scientists, who had taken for granted until now that their productive skills made them safe.

Science the mystifier

Technological growth is one of the factors reducing the control that people could have over their own lives. Scientific specialisation has generated enormous technical advance, but in doing so technology has become a mystical entity with its own narrow language and rituals. In technology many people put their trust, but over it they can have little influence because they believe that it has progressed beyond their powers to comprehend it. The boom in commercialised "do-it-youself" activity conceals a withering of deeper scientific curiosity in the layman, parallel to the withering of political enthusiasm - see for instance the trivialisation of most courses now offered by the Workers' Educational Association.

Specialisation, centralisation and mystification are generators of apathy. Science has replaced religion in enabling people to accept their powerlessness, and the white-coated technological elite are the body of priests.

Don't just stand there puzzling— Do something....!

Questioning among scientists in the last twenty years began with the Bomb, moved on to (now trendy) ecology, and since then has split into a number of over-lapping tendencies such as alternative or intermediate technology, community science, and even anti-science. Symptoms of the new search for things to do are: 'Undercurrents' itself, Friends of the Earth, the British Society for Social Responsibility in Science (BSSRS), the Intermediate Technology Development Group, in the States is "Science for the People", and so on.(1)

There are various activities for those who don't reject science in total. Some people are devising revolutionary but often technically simple methods of production and construction, new ways of using resources. These seem most appropriate for rural use in developing countries, but people with a yen for the remote life of a Welsh or Scottish commune are beginning to apply them in Britain. People planning such independent communities usually intend to be as self-sufficient as possible.(2) While within themselves they may in time break down technological elitism and demystify their science, an alternative rural community does not grapple with these same problems where they affect the 80 or 90% of people at present living or working in urban Britain.

Urban areas are more the concern of those moving towards "community science", conceiving of bodies of scientists who will serve local communities as independent allies and advisors to enable people to combat and negotiate with local authorities, city planners, industries polluting the local environment, and so on.(3.) This form of community science on its own offers no means of support to its participants, who must therefore earn their bread from conventional jobs (which they put at risk by their activities unless they have found a safe academic haven) or from the dole. These two major areas of activity are seen by some to complement each other, and certainly some individual scientists are active in both. But <u>neither</u> of them offer to people at present working in towns, very much in the way of making a living.

The worker-scientist

There should be no misunderstanding:- the radical technologist we have in mind is not dealing mainly in way-out freaky science and invention; nor is he just a political activist (though he may be both of these in his spare time). The technology he deals with will be bound to be largely of an everyday practical kind geared to production for living. What is radical is his application of it, and his role in the factory or workshop. The radical scientist is a technically trained woman or man who will be involved in both manual and metal work. In some firms shop-floor workers can "go up" to work in the labs; we know of nowhere in this country where the scientists "come down" to work seriously on the shop floor. Still less do we know of places where the status difference implied in 'up' and 'down' have been converted into mere horizontal task divisions.

The BBC has recently run a series on "Are hierarchies necessary". In this Robert Young has said about the division of labour:-

"People have differing talents, propensities and tastes. And of course different people will fancy doing different things. The division of labour <u>is</u> sensible and <u>is</u> efficient. But expertise all to easily gets mixed up with domination and with deference". (4.)

Robert Young would like to abolish the correlation between divisions and power. But one of the main reasons for this 'mixing up' is that people do not equally want to do all the tasks that need to be done, indeed there are many jobs that few fancy but many have to do. These tasks in everyday production and services are repetitious and require little skill. In order to break down the manual-mental division of labour these are the tasks that most need to be shared out.

This is why the radical scientist earns his living in blue overalls. He is one among a group of workers.

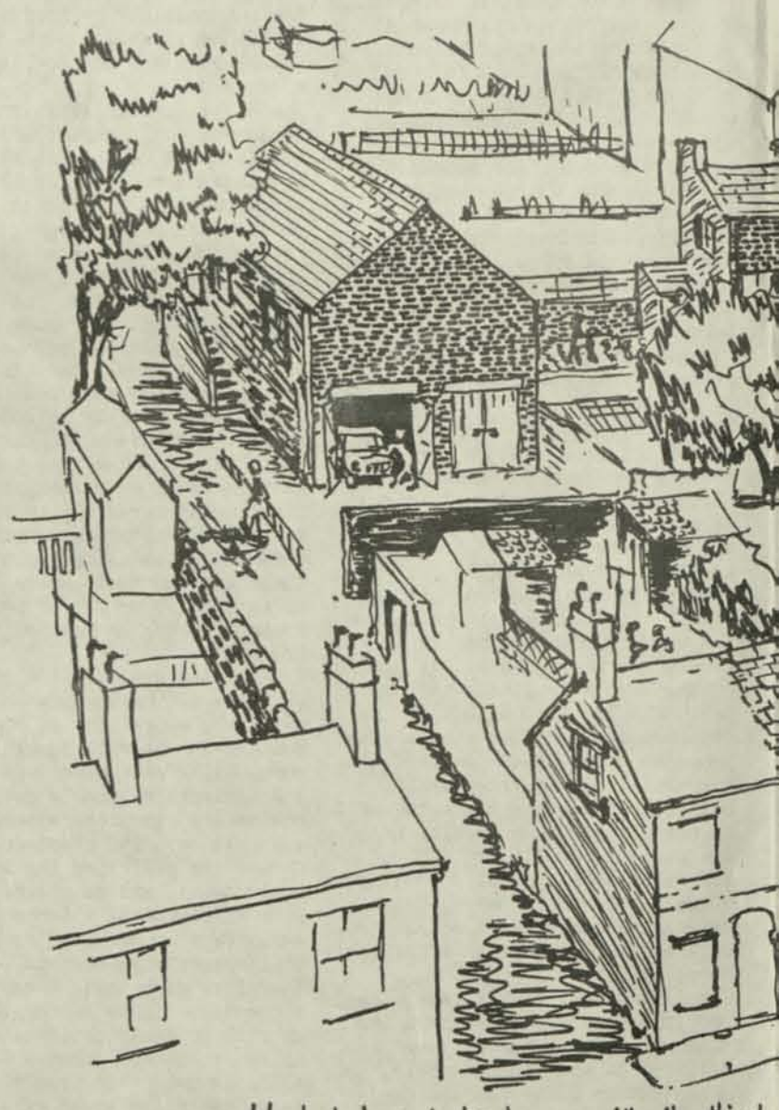
He not only designs products, but also collectively shares in all stages of development, production and selling. The tasks that he and any other of his workmates do at any one time are collectively decided by the work-group as a whole. Much manual work requires an expertise which he will learn. On the other side he will put scientific knowledge at the disposal of his fellow workers and users to use in ways they decide are most socially useful. He is more than a scientist with radical ideas; he is a worker-scientist, with the task of sharing his scientific experience with his fellow workers. (5.)
His objectives are: that the people working with him will take over much of his specialist decision-making role, that they develop the ability to appraise critically his own scientific judgement, and that collectively the working group as a whole can take informed decisions in order to control as far as possible all aspects of their working and living situation.
Which is where the 'radical scientist' converges with a totally different reason why we want to do what we are doing.

Workers' control and workers' self-management

Parallel with trends in science and technology is the recent boom on the "expertise" of management. Long existing relations of "domination and deference" have been reinforced in our democratic era by the growth of an elite specialised in human and financial organisation. We do not deny that there are skills in management and co-ordination, but rather more than in science these are skills which most people can acquire to some degree. Most employees are able to judge the skill of their managers in operation. Management of humans at work is by nature authoritarian. Indeed, even those recent trends in "worker participation" which are management inspired are intended to reinforce the existing power relationship by more subtle manipulation:
"...one of the most seductive levers of social control that the ingenuity of man has ever invented". (4.)
Very different in its objectives is the movement for workers' control or self-management, which implies at least worker ownership and worker appointment of people to management tasks. The movement ranges politically from left-Marxist and anarchist groups, through the Institute for Workers' Control (I.W.C.) and the less politically motivated Industrial Common Ownership Movement(I.C.O.M.) to sections of the Liberal and Labour parties which have discussed 'participation'. The range of genuine industrial democracy envisaged, and the extent to which it is seen as a force for radically changing society, varies enormously along this spectrum.

Practical precedents

There have been various attempts to establish small-scale industries with democratic organisation and ownership.
In the nineteenth century, apart from the short-lived and utopian efforts following Robert Owen and then the Christian Socialists, the first long-lasting attempts were in the co-operative movement. Factories which affiliated to the Co-operative Productive Federation (C.P.F.) based on Leicester began in the 1880s, and a handful still operate although the degree of worker participation has declined drastically. In the twentieth century the main developments have been abroad: Jugoslavia (workers' self-management), Israel (kibbutzim, and trade union owned firms), France (the 'Communities of Work'), Algeria, China, all have varying degrees of democratic production.
In this country the most recent practical attempts have been the factories which are linked in I.C.O.M., most of which were "handed over" by their owners to the employees. Also affiliated to I.C.O.M., but originating in the Peace Movement of the early 1960s, are the two small Rowen factories in Glasgow and South Wales. These are probably the most democratic of all. The most recent recruit to I.C.O.M. is Fakenham Enterprises Ltd. This firm has been formed by the leather-working ladies whose factory occupation and work-in to resist redundancy was well publicised earlier this year. Such attempts at industrial democracy are increasing.
Observers disagree as to how democratic is the control by workers in different cases, but some firms offer useful precedents, and some offer lessons on how not to do it. We agree, however, that



Workshop and two houses with the third

the struggle for workers' control must remain largely in existing industry, and we do not see our own ideas as an alternative to this. But we do think a case can be made for some of the people concerned about workers' control to attempt to construct something of it in our lifetimes, not only as experiment and inspiration, but also as a means of opening up, to people in or out of work, other ways of making a living.

'Communal Factories'

A year ago three houses and a largish (1300 sq. ft.) workshop were obtained in a working class area of Sheffield - price just over £4,000 - property is still a quarter of prices in the South, though rising fast. Most of the people involved in this were primarily interested in shared accomodation, but one or two of us have long-term plans for workers' controlled production. The general idea is to set up a workers' controlled workshop or factory with a common-ownership or co-operative type of constitution similar to the Rowen firms, but combined with communal or semi-communal residence. Starting premises are available now.

The overall idea became known, for the time being as "communal factories", although it needn't lead to a vast factory, and needn't be entirely communal. The main emphasis would be on production of some kind, fairly labour intensive at first to avoid high capital costs in equipment, and commercially viable as a bread-winning activity. We think the products should not be too much in the individual craftsman line, should be useful, and not waste-making. But apart from that, what we make will depend on the group of technical initiators which forms.

By combining community living with this productive support system, a number of other activities become possible-craft, horticultural, educational, social, community action, etc. An "urban kibbutz-type factory" is another way of putting over the essentials of the idea.

Shared living in a number of different adjacent houses can be as communal or as private as each house may wish. At present eleven of us and four children eat together once a day and share chores. People have separate rooms. We wouldn't see shared living as obligatory on all workers in the factory, neither need all residents be member-employees. But it is practical and economic, and would be an extremely convenient way of raising starting capital in the early days of a productive project. Also, some of us enjoy it.

Technical initiators for workers' control

Further accomodation is coming available before the end of the year. We envisage this being used by a broad group of practically-minded worker-scientists and technicians, trying to interrelate their skills in various branches of science to provide the technical initiative to get viable production off the ground. We have premises (although our only equipment is in joinery at present) where people can develop new things, or modify existing technology to produce old products in new ways. Not all the 'technical initiators' need be permanent residents-for instance we already have an offer from a metallurgist willing to spend part of her next year exploring the potential of recycled plastic sheet—perhaps as a substitute for plywood.

During the pre-production period as many people as possible will have to find outside employment in order to keep themselves and raise the starting capital. No secure wages can be promised for any of us, but some may be possible, and when the project is able to support its workers, it is envisaged that incomes from it will be equal, or related to family need rather than to skill, and certainly not to formal qualifications.

As production expands, it will provide a living for more locally recruited member workers who will, as they increase in numbers become the major force in self-management. It could also provide facilities for the outside community-use of the workshop, play groups, technical advice and services for neighbourhood residents, and so on.

If you're practically minded, technically skilled, have ideas, and are available now or in the next two years, write mentioning your skills, experience and age to:-

'Communal Factories',
71, Thirlwell Rd.,
Sheffield, S8 9TF.

behind

Dave Hayes
Robin Fielder
Mavis Kirkham

Notes on some organisations and writings

1. 'Undercurrent', a magazine of alternative technology; 34 Cholmley Gdns, Aldred Road, London NW6 1AG (01-794-2096).
British Society for Social Responsibility in Science, 9 Poland Street, London W1V 3DG (from Oct. '72).
Friends of the Earth happens to be at the same address.
Intermediate Technology Development Group, 9 King St., London WC2E 8HN.
'Science for the People', produced by SESPA (Scientists and Engineers for Social and Political Action), 9 Walden St., Jamaica Plain, Mass 02130 USA.

2. Robin Clarke's article, "Soft Technology: Blueprint for a Research Community" (Undercurrents No.2) is the soundest outline we've seen on 'soft technology' for self-sufficient communities. It makes clear the way such communities need to work out their dependence on the outside world in order to slowly assert their self-sufficiency. The project is to provide a 'third alternative' to being under-developed or industrialised. Unfortunately most urban dwellers have no choice in the matter, and some projects at least will have to take people where they live and work at present. However, it would be a pity if potential members of rural projects were deterred by being unable to find local outside employment before self-sufficiency. We understand further enquiries would still be welcomed by Robin Clarke, 28 Avenue de Belloy, 78 le Vesinet France.

   We are not opposed to rural communities, but see greater advantages for both in linking schemes in complementary urban and rural environments which can exchange labour, equipment, produce, etc., and ease the transition to self-sufficiency.

3. David Dickson, in "Science to Help the People" (New Scientist, 4 May 1972) suggests that "independently funded Community Science Resource Councils could provide the necessary expertise to groups challenging policy decisions at regional or government level". Jonathan Rosenhead has prepared a statement on community science for the BSSRS meeting on the subject planned for early next year.

4. Robert Young, "Darwinism and the Division of Labour", Listener, 17 August 1972.

5. Robert Jungk makes some useful comments on workers solving problems, and the "renaissance of artisanship" in "Politics and Technology", The Spokesman, No.23 June 1972-issue on Socialism and the Environment.

6. Institute for Workers' Control, Bertrand Russell House, 45 Gamble St., Forest Road West, Nottingham NG7 4ET (0602-74504/5).
Industrial Common Ownership Movement, 8 Churton St., London SW1. (01-828-2321, 01-834-8642)

'IN THE MAKING' Suggestions for A Directory of Proposed Projects for Radical Technology

We know of a dozen or more groups of people or individuals who are planning within the next year or so to initiate projects in the manufacturing or other productive fields. Most are still looking for people, especially those with skills and experience, to join in establishing their projects. The Directory of Alternative Work (Uncareers, 298B Pershore Rd., Birmingham 5) lists some projects in this field, among more general educational community action, drama and craft projects; but it can only deal with projects which already exist. We and Uncareers both feel the time is ripe to complement this information with a directory of projects which are still in peoples' minds - in the making.

So far we foresee three sections:-

1. A Directory of proposed projects, provided that:-
   a) they are to be democratically run and owned;
   b) they are to be productive and/or offer long term ways of making a living for their members, and preferably also for local people. The intention should be to be economically viable or self-sufficient. Workshops, restaurants, computer services, technological communes would count for instance, but not, we regret, free schools, info services, arts groups - although some productive projects do hope to include these as ancillary to their "bread winning" activity.
   c) their initiators have already taken at least a few steps to put their ideas into effect, e.g. by attempting to contact people, thinking seriously about products, looking for premises, products, etc.

2. "Profiles" a list of self-written details of people who are not committed to a particular project, but who would like to get in touch with others like-minded, or with existing projects. Write not more than a 100 word profile of yourself, being sure to include age, technical/practical skills, training and qualifications (if relevant or interesting). You might also like to say something about your work experience, interests, the kind of project you would like to join, parts of the country you would prefer, and whether city, town, village, or complete country. Most people will be happy to publish names and addresses, but some, because of their present jobs, etc. wish to remain anonymous, in which case for publication put a pseudonym and the town or general area where you live. (in which case be sure to enclose 2 or 3 s.a.e.s. for us to forward replies to you).

3. News and Information of projects, ideas and experiences of starting, recruiting, possible products, financing, finding a place, legal problems and constitutions, organisations, social and political objectives etc., etc..

We hope "In the Making" will be produced at least twice a year, and supplementary 'profiles' may be sent out more often. We aren't sure how it is going to be financed yet, but meanwhile let us have your views on whether it should be sold openly, or would be more appropriately circulated internally to contributors and subscribers.
For the time being please send potential written contributions with s.a.e. to:-
"In the Making", 71 Thirlwell Rd., Sheffield S8 9TF.

Robin Fielder
Brian Bridge

UNDERCURRENTS

in Science and Technology **No 3 25p**

UNDERCURRENTS

Autumn/Winter 1972

IMMANUEL VELIKOVSKY
The Man the Scientific Mafia Couldn't Muzzle

THE OIL BUSINESS
Stop This Exploitation Now!

GINSENG
Just Chairman Mao's Cup of Tea

AMRA ARMA
Electronic Priesthood in Weird Rites at Roundhouse

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ECO UNIT
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CANCER RESEARCH
Cough Sweets Are Not The Answer

PHONE PHREAKS
"Is Nothing Sacred?" Say Post Office

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FREE THE MEDIA

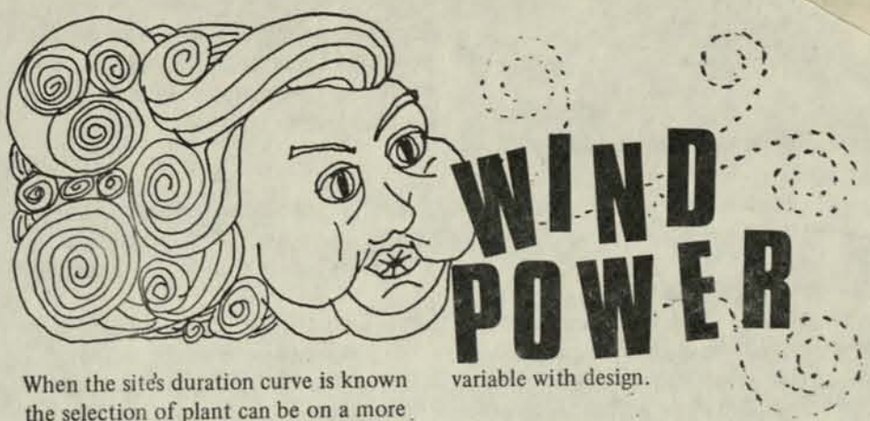
ANTHONY WEDGWOOD-BENN was right. The media are manipulated, subtly but nonetheless effectively, by the establishment interests that control them.
The particular brand of Democracy under which we exist has been aptly described as "government of the people, by some people, for those people." Those people found Mr Benn's Labour Party Conference speech a little too close to the truth for comfort, and ensured, by a mixture of selective quotation, biassed headlining, and a liberal sprinkling of outraged disclaimers from such disinterested figures as Lord Goodman, that his remarks were misinterpreted by the majority of the British public.
What Mr Benn said was that trade unionists in the media should take steps to ensure that what is said about working people is true. Now "truth in the news" is something, surely, that every newspaper and TV tycoon would claim to uphold. So why all the fuss?
The fuss was because Benn was stating the principle that no one should have the right to distort the news to suit his own sectional interests. And since the main violators of that principle are the newspaper proprietors and media barons, it was against these gentlemen that his remarks were primarily directed.
To deflect public attention from their own sinister role, the press and TV chiefs chose to slant Benn's speech in such a way that it appeared as if he was urging the tea ladies and lift men at every newspaper headquarters to go on strike until the news was distorted in their favour. But what Benn was suggesting was simply that media workers should ensure that what their bosses propagate is undistorted.
Of course, in absolute terms there is no such thing as undistorted news.
Every journalist is influenced by his own limitations and preconceptions, which constitute what one might term "source distortion".There's not much one can do about source distortion except rely on the integrity of the journalist, and hope that he is trying to tell the truth as honestly as he can. (Though so-called "objective reporting", where equal weight is given to both sides of a case irrespective of validity, can often convey a distorted picture of what the journalist knows to be the truth.)
But the major cause of distortion in the news today is not source distortion, but deliberate manipulation of opinion by those who control the wealth of this country. Needless to say, this manipulation is not done in an obvious manner. It is seldom necessary actually to cut a news item, or to tell a deliberate lie.
All that is required is to ensure that senior editors and programme controllers are men who, basically, uphold the status quo, and to create a climate of opinion, in newspapers and commercial TV especially, where the commercial viability of the medium is constantly under pressure. In such a situation, the word soon filters through that articles and programmes which seriously question the underlying assumptions of the current economic and political system will at best be regarded as "cranky" and at worst a threat to the audience ratings, or the advertising revenue, or both. It's a brave journalist who consistently writes from a radical viewpoint; and a lucky one who keeps his job for long having done so -- apart from the "uncle Toms" that editors give rein to from time to time, just to show how liberal they are.
The power to control a nation's behaviour and beliefs by filtering its channels of communication is now the most powerful single weapon in the hands of the exploiting class. By wielding it skilfully, in conjunction with judicious management of the economy to produce "prosperity" at election times, Richard Nixon has just succeeded in persuading the majority of Americans that the poor can only stay off the dole queues if the rich are allowed to get even richer. And the skipper of "Morning Cloud" is more than half way to achieving the same end in this country.
If he, and Nixon, are to be stopped, the media must be wrested from the hands of the millionaires and placed under democratic control . And there must be an increase in the number of alternative media -- from neighbourhood newspapers to community video. Otherwise we might just as well sit back and smoke away the twelve years until 1984.

WIND AND WATER are direct and

WE'RE SORRY this issue of UNDERCURRENTS is so late.
Part of the reason, of course, is that everything seems to stop dead during the Summer -- people go away, copy doesn't get written, and no one sends us any money. So preparations for this issue didn't really get under way until September.
Another major cause for the delay is that, to save as much money as possible, we do almost everything ourselves.But it takes time. When this issue finally emerges, the sheer process of production will have taken the best part of two months.
So please bear with us when your UNDERCURRENTS doesn't appear when it should. We're doing our best.
The last issue of UNDERCURRENTS ought to break even -- when all the money outstanding comes in, that is. We got rid of about 700 copies in Stockholm at the UN Environment Conference in June.
In the UK, sales of the last issue went extremely slowly over the summer, but we managed to distribute about 1200 copies eventually. Most of these are now sold, though we still haven't got all the cash back.
It's a pity to keep harping on the unpopular subject of money, but it's the root cause of UNDERCURRENTS' biggest headache at the moment-- the problem of cash flow. Even though an issue may sell in three months more than enough copies to break even, we have to pay our printers and paper suppliers within a month or so of printing, and we have quite a few expenses , like typesetting, that have to be met even before the issue's printed. So we need working capital to tide us over until the cash comes in. Since we haven't got any actual money, we work on a bank overdraft of up to £100 (a laughably small sum compared to the amounts available to almost all other magazines) augmented from time to time by various kind people who help out with short-term loans.
This is a pretty unsatisfactory state of affairs. It leads, for instance, to the present infuriating situation where we would like to change to a cheaper, and better, paper supplier, but we can't afford to because our present suppliers give us credit.Like it or not, we live in a capitalist society, and until we manage to change it for a better one, we simply have to have some money if we're to survive. It's the classical dilemma: in order to change the system, you have to some extent to use its methods.
So at present we're looking at the possibility of forming some kind of democratic structure into which money can be channeled -- assuming we can raise any, that is. A "Company Limited by Guarantee" has been suggested, but if you've any other suggestions, please let us know.

THIS ISSUE marks a new departure for UNDERCURRENTS. From now on, we'll be mailing a monthly news bulletin to subscribers only. Distribution would be too much of problem if we were to try to sell it in bookshops.
It'll be printed on an old Gestetner duplicator that we picked up for £20 recently.
The first issue is enclosed with the main UNDERCURRENTS package. Subsequent issues will be sent out separately, by first class mail to UK subscribers, and by air mail to everywhere else.
OK, so this means the subscription's going up -- from £1.20 to £1.80 for UK subscribers and £2.00 for overseas subscribers. But for an extra 60p or so, you'll be getting all the news that's fit to print, and a lot that isn't, on what's happening in fields like alternative technologies, the environment, counter-technology and radical scientific research in general.
You can't say that isn't a good deal.

UNDERCURRENTS Number 3 comes to you by courtesy of Ant Stoll, who was invaluable; Sally Maloney who designed the pages;John Cima (ho ho) who drew things; Sooty the Greek, who philosophised; John Prudhoe,who enthused;Peter Harper, who catalysed; and Godfrey Boyle, who editorialised. Not to mention, of course, Geoff Watts, Glen Thomas, Wendy Beale, Ann Miller, Andrew Singer, Rick Mike Jim & Nigel at CPM, David Gardiner, Charlie Clutterbuck, Dave Hayes, Robin Fielder, Brian Bridge, Hugh Sharman, Andy MacKillop, Tim Gluckman, Norman Beddington,Martin Richards, Lynn Gambles, Alan Campbell and Tony Durham. And Jay Switzman & Pat Coyne at Southbank Poly, Stephen Fulder whose name should have appeared on the Ginseng article, and Herman Donner who lent us his flat in Stockholm. And anyone else whose name escaped us in the middle of the night when this was written.



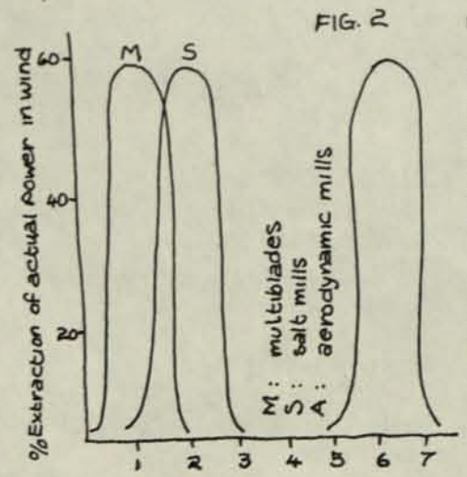
WIND AND WATER are direct and contemporary results of incident solar energy.Wind , however, is much more variable than water in its short and medium-term behaviour and, as a result. many think it can only be used, for instance , in Western and Northern Britain where strong wind is the rule and not the exception. This is not true, although it is certainly easier to translate wind energy where the source is abundant.

The wind energy on a surface depends on its area (A) and the wind-speed (V) cubed. There is some disagreement as to the theoretical extractable energy but the generally used formula is:
Maximum extractable power = $0.59.kAV^3$ where k depends on the units used, and A and V are in the same system of units. In mks units: Maximum extractable power (Kilowatts) = 0.59 x0.00064xAV^3. Therefore the theoretical output maximum for a 6m mill in a moderate breeze (Beaufort Scale 3-4) of 5m/second should be 1.4kW. In practice 60% of this is the usual maximum for a good plant.

In many Western,Northern and Eastern coastal regions of Britain the annual average windspeed is over 5m/second, being 6.5 – 7m/s at favoured sites. This should not be taken to mean that a 6m mill, delivering about 1.35kw can do so for all 8800 hours in the year - and so give 12,000kw hours! A good thing to remember is that well-designed plant can just achieve 5% translation of yearly total theoretical energy extractable. This still means in the above example a yearly total of about 600kwh — over 80% of average yearly domestic lighting energy consumption.

For any individual site the most important information needed in deciding on wind use is what kind of winds occur there. For the vast majority of places in the UK this information is either partial or completely absent When wind speeds and duration through the year are plotted against each other curves similar to the one shown in Fig 1 are obtained. When the wind regime is poor the curve shifts down and to the left, and vice versa.

FIG. 2



When the site's duration curve is known the selection of plant can be on a more scientific basis. The average speeds will decide the optimum speed of rotation for the plant - this is called *plant rating.* However, the need to ger as much energy as possible (by turning in fast winds) has to be set against ability to run as many hours as possible (by working on low speed winds). Obviously here there must be a compromise.

If, for example, the site duration curve flattens at around 5m/s this should be the chosen rating speed. If your demand is for electricity this is very significant in deciding the type of plant. With electrical mills - aerogenerators - there has to be ancillary storage, power control, gearing and a governed dynamo for the system to be competitive with mains electricity. For lighting alone there is less need for highly accurate power control and if storage is not required (implying being able to do without power when the wind is too poor) lighting electricity can be quite successfully supplied by a small aerogenerator.

When mechanical power only is required the design of plant and translation equipment is less complex; wind driven heat pumps, workshop machinery and agricultural power take-off are typical applications that are possible.

A general wind machine choice is between high rotation-speed mills and lower rotation-speed plant that can exploit the long low end of the duration curve.

High speed (or aerodynamic) mills are nearly always the electricity generating choice, because their shaft speeds reduce the need for power-consumptive gearing up for dynamo operation. Lower speed mills can be general purpose.

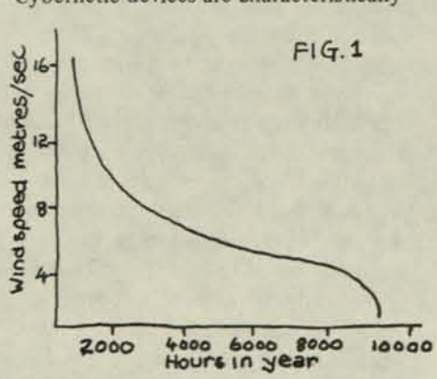
Mill blade design and size controls the blade's ability to respond to differeht wind speeds; With the three major horizontal-axis types of mill the efficiency of the plant in extracting energy from thewind depends strongly on the ratio of blade tip-speed to wind speed(λ ratio). Aerodynamic (plane type) mills have the highest λ, sail type (traditional) mills come next,and the multiblade (farm type waterpumps) have the lowest. Vertical axis rotors and turbines come in the same area as sail type mills but are also highly variable with design.

The different performances are shown in Figure 2.

For most dynamos the shaft speeds required for charging to start are over 650rpm; rewound dynamos can bring this down to 150rpm or so. The λ ratio indicates what size the mill should be to give the power required for the dynamo, and if of true aerodynamic design the tip should rotate at about 6 times wind speed. Thus, for a 6m diameter mill, rated to a 5m/s wind, Maximum output of about 850W should come with the shaft rotating at 27.5 x 60/6λrpm, or 90rpm. Thus if 650 rpm is required for the dynamo the gearing must step speed up to about 180rpm. Thus gearing and dynamo must be related to the plant chosen, and this to the wind regime; these must be handled together and integrated for successful useof the available wind energy.

To prevent wind damage to the mill - particularly aerodynamic mills - the shaft and/or blade performance must be controllable. In the case of plane-type blades this is achieved through 'feathering' which is controlled by governor devices. Feathering alters the balde profile presented to the wind: as wind speed rises, the blade "thins", and vice-versa. . There is often also a 'knock-down' system where really large wind speeds are allowed to make the mill fall out of the wind. This is achieved by the use of a spring holding the mill base in all winds causing less than a designed-for maximum pressure. Centrifugally operated brakes are also sometimes used, and on simpler, low-cost plant, a friction brake on the shaft. Apart from the last-named all these 'Cybernetic' devices are characteristically

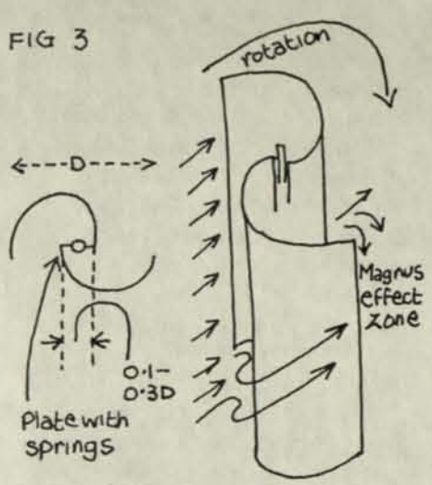
FIG. 1



expensive, or arduous to produce – particularly for aerodynamic mills, which are of complex, close-tolerance production, at least initially.

Sail type mills are almost thought of as relics. Made of wood, with their double feedback systems of governor operated device (the 'spider') to alter blade solidity, and a fantail (vane) to shift the large cap into changed wind directions, they were highly sophisticated compared with other technologies of their time, over 200 years ago. Today, replicas would be fabulously expensive, and their output of up to 100 KW would be difficult to use in many cases. In Denmark the Lykegaard firm makes a rationalised version based on 30 years of research into the elements of sail mills. Simple metal or wood arms are used to support many small blade sections of the correct profile, and linked to a simplified governor for control; two light fantail blades control orientation. A Lykegaard mill of a typical 30KW output (electrical) costs over £2,500 but for 20 years or so can give all lighting electricity (and enough for many other activities) for 25 families or so. Aerodynamic mills are more expensive per kilowatt. The usual retail price of a 1-3 KW plant is around £150 - £400, or over £100/KW.

FIG 3



Multiblades have the lowest λ. and although of not large power, can give high total energy translations over a period. These machines can turn in winds less than a gentle breeze (2.5m/s) but, at about 30 - 40 Watts for a 15 foot multiblade in this wind, they are obviously not suited to electricity production. Their mechanical power can be used in many ways – for instance driving solar collector/distribution equipment; running a friction-heat machine (callendar type) to give background heating; or powered workshop equipment. Off the shelf, these mills although of very simple design, can be very expensive (over £150 for the mill alone). However, there are many at present 'resting' in farmyards and can be bought and refurbished at low costs.

The above mill types comprise all the real possibilities in horizontal-axis wind machines. But vertical-axis and innovative plant are very different areas.

The vertical-axis mill dates back to the Chinese sail mill of 500 BC, which was 1700 years before the first European mill.

Until about 1910 little improvement in vertical-axis mill performance had been achieved. The Finnish designer Savonius in that period evolved the rotor named after him; this rotor is essentially a bisected cylinder with the two halves displaced. As the assembly rotates there is a fall in pressure on the side away from the striking wind. This, called the Magnus Effect, assists the rotation. This effect also occurs on any tail rotating cylinder, as was shown by a man named Flettner who, in the 1930s, sailed a 450-ton boat across the Atlantic Ocean powered by two tall cylinders, whose rotation was assisted by a small fuel engine. By steering correctly he was able to keep the zone of low pressure on his cylinders in the direction he wished to travel, with resultant motion in his preferred path.

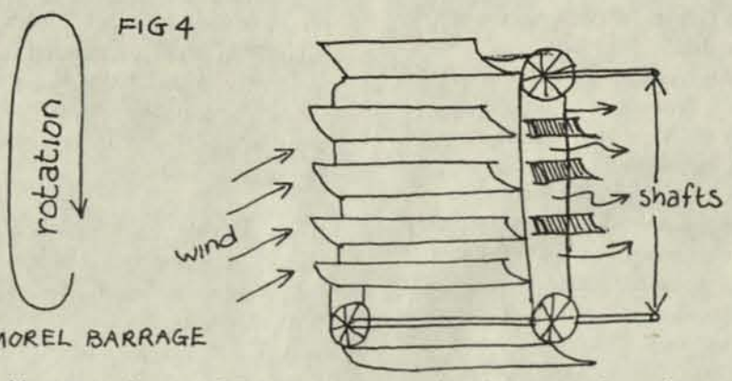
A Savonius rotor is probably the cheapest possible wind machine. This is due to its shape and the Magnus effect, which makes it act as if it had an area 4 times its real size. A typical design is as shown in figure 3:

By equipping such machines with correct poundage springs the Savonius rotor can be varied in size with varying wind speed. As the displacement increases, shaft speed will tend to drop; thus the rotor is allowed to increase with wind speed, to give a constant shaft speed. For this reason it is probable that a large Savonius, say of 5m by 3m could give adequate power for lighting. Moreover, the plant is demountable and can be used successfully to operate small boats. And since the rotor will give useful resultant with wind from about 210°, it is superior than the 180°or so that normal boats can tack in.

Other novel wind machines include the Morel barrage, and Dave Stabb's flying windmachines and tree-pumps, *(see Undercurrents No. 2).*
The Morel barrage is basically a continuous loop of slats of a profile that causes rotation in one direction on the wind-incident surface, and in the other (reinforcing) direction on the wind-exit side.

Dave Stabb's tree-pump exploits the natural yield and recovery of tree boughs in the wind. By attaching pumps between boughs useful work can be obtained. In his flying windmachines, Stabb has exploited the known fact that wind at a height is always more powerful and constant than at the surface. Horizontally, the problem of turbulence makes it necessary, as a general principle, to try and ensure that there are no large obstructions within 500 feet of the mill, and that it is at least 40ft off the ground. But at a height of 1,000 ft the wind is often 1.6 or more times the surface speed. By "anchoring a kite at this level, and by making it continually oscillate up and down, a rapid jerking movement will be caused to the attachment rope. This can be translated into useful work – for example, pumping, the Callendar type heating machine, and so on.

FIG 4



THE MOREL BARRAGE

Although vertical-axis mills are the oldest, today there is no manufacture at all of these machines, tested for over 2,000 years. The Morel barrage machine was experimented, fairly successfully, at the 30kW level before 1939, but today none are made. Needless to say, the tree pump and the flying wind machine have not attracted praise in many aerodynamic engineering areas, but this should not prevent experimentation with these novel and low-cost machines.

Andrew MacKillop

REFERENCES
Vol. 7, UN Conference on New Sources of Energy, UN 1964.
The Generation of Electricity by Wind Power. E Golding. Spon, 1955.
Discovering Watermills. J N T Vince, Shire 1970
Windmills and Watermills. J Reynolds, Praeger 1968.

VELIKOVSKY FOILS THE INQUISITORS

BY GODFREY BOYLE

IMMANUEL VELIKOVSKY could some day emerge as the Galileo of the 20th Century.

He has not, as far as one can tell, been actually threatened with torture, or hauled before an Inquisition and forced to recant his unorthodox beliefs.

But his book "Worlds in Collision", in which he put forward the revolutionary notion that the Earth may have been involved in cataclysmic near-collisions with Venus and Mars as recently as three thousand years ago, was greeted on its publication in 1950 with an intensity of scorn, derision, abuse and indignation usually reserved for fraudulent mediums, flying saucer cranks, and purveyors of patent hair restorer. Only in recent years has the storm begun to die down.

Yet Dr Velikovsky was no quack. His book, far from containing the airy ramblings of some fanatic, was packed tightly with evidence and woven closely with carefully-reasoned arguments. Moreover it contained, in the best scientific tradition, a whole series of predictions specifically designed to enable tests to be made of the validity of its hypotheses.

Velikovsky's pedigree, too, was impeccable.

Born in Tsarist Russia in 1895, he received his medical degree from Moscow University in 1921, after pre-medical study at Montpelier in France and at Edinburgh University.

He then went to the University of Berlin where he edited an academic publication called "Scripta Universitas", of which Albert Einstein, no less, was co-editor.

In Berlin, he married Elisheva Kramer, a young violinist, and in 1924 the couple moved to Jerusalem, where Velikovsky initially worked as a general practitioner. Later, he began to practice as a psychoanalyst at Haifa and Tel Aviv, after a period of study in Zurich and in Vienna under Freud's pupil, William Stekel.

While in Palestine, he helped found another academic journal, "Scripta Academica", to which Prof Chaim Weizmann contributed the first monograph monograph on biochemistry.

Immanuel Velikovsky -- was he right after all?

Just before World War II broke out in 1939, Velikovsky went to New York to do some research for a psychoanalytical book he wanted to write -- a book about the dreams of Freud and in particular about the images of Oedipus, Akhnaton and Moses which seem to have played a prominent part in Freud's thoughts.

In the midst of his research on Moses, an idea suddenly struck him. Perhaps the Biblical descriptions of the plagues and destructions that occurred when the Israelites made their Exodus from Egypt were not simply allegorical, or just exaggerations? Perhaps they could have been descriptions of a real natural catastrophe?

At that stage, Velikovsky was mainly interested in using any evidence of a catastrophe as a guide to the date of the Exodus in Egyptian history -- an issue which scholars have long debated. The mind-boggling implications of the catastrophe itself were not yet apparent.

After a good deal of searching, he found what appeared to be confirmation of the Exodus catastrophes in an obscure papyrus by the Egyptian sage Ipuwer, who wrote of the downfall of the middle kingdom of Egypt in terms that closely paralleled the Exodus account.

But the trouble with Ipuwer's narrative is that the era of the Middle Kingdom, when he wrote it, is conventionally assumed by archaeologists and historians to have been some 500 years before the the Israelites left Egypt.

So Velikovsky was faced with two equally-unthinkable possibilities: either conventional Hebrew chronology is 500 years too short, or conventional Egyptian chronology is 500 years too long.

A patient investigation of Egyptian records, however, revealed numerous instances of events and personalities occurring twice -- once in the sequence pieced together from archaeology and once again in the chronology constructed from the writings of ancient Greek historians. "Many figures," Velikovsky deduced, " are 'ghosts' or 'halves' and 'doubles'. Events are often duplicates; many battles are shadows; many speeches are echoes; many treaties are copies."

Having explained to his own satisfaction the 500-year discrepancy, Velikovsky sought to discover further corroboration of the catastrophe in the records of other ancient peoples.

Eventually, a whole series of parallels -- such as the similarity between events described in the ancient Mexican "Annals of Cuauhtitlan" and events chronicled in the Pentateuch and the Book of Joshua -- convinced him that there had indeed been catastrophes in relatively recent historical epochs, that these catastrophes were Global in scale, and that their cause was extraterrestrial.

The revolutionary implications of such a thesis so absorbed Velikovsky that he changed his mind about going back to Palestine, as he originally intended. He decided instead to take up permanent residence in the USA. And there, for the decade from 1940 to 1950, he worked painstakingly on the manuscripts for two books -- "Ages in Chaos", in which he put forward his revised chronology for the Near East between 1500 and 300BC, and "Worlds in Collision", where he set forth the evidence for Global catastrophes of interplanetary origin.

At this point, despite the risks entailed in any attempt to summarise such a bold and all-embracing synthesis, it is possible to outline the main events described in Velikovsky's writings as follows. a fuller summary, from

the American magazine "Pensee", is given overleaf.

The Solar System has not always been in the calm, ordered state of celestial harmony in which we find it today, a state where gravitational forces balance inertial momentum to produce the steady elliptical orbits of the Planets which, according to conventional scientific thought, have persisted undisturbed for millions upon millions of years.
According to Velikovsky, the planet we know today as Venus was unknown to ancient astronomers before 2000BC. Venus came into being, he says, as the result of some kind of eruption on Jupiter, and began its life as a huge, fiery comet moving in a highly-elliptical orbit around the Sun.

After wandering about the solar system in a most alarming manner for hundreds of years, the comet's orbit brought it into near-collision with the Earth about 1500 BC. The interaction of the gravitational and electromagnetic fields of the two bodies altered the Earth's axis, causing collosal earthquakes and tidal waves that destroyed entire civilisations. And the comet's tail, as it swept across the Earth, gave rise to showers of meteorites and rains of hydrocarbons, enveloping the planet for years in a dark mantle of cloud.
Some fifty years later the same comet made a second approach that wreaked similar devastation.
Thereafter , though men watched the skies in fear for hundreds of years, the threat of collision appeared to have gone.
But in the eighth century BC the comet passed very near to Mars, causing immense upheavals there and setting Mars on a course that would soon swing it across the path of Earth.
Between the time of Rome's foundation in 747 BC and about 686 BC, another series of great cataclysms occurred, and the Earth's axis and orbit were once again altered in several near-collisions.
Out of this interplanetary "battle" between the comet, Earth and Mars, order finally emerged in the pattern we see today, with Venus no longer a comet but a planet pursuing an almost circular orbit between Earth and Mercury, and Mars on a similar path between ourselves and Jupiter.

It takes no great perspicacity to see that such a radically different conception of the Solar System's evolution blows great gaping holes in a lot of dearly-cherished orthodoxies.
Any man who puts forward such a theory must expect a certain amount of opposition.
But the reaction to Velikovsky's thesis, even before it had been published, went far beyond the normal process of detached, considered criticism that usually accompanies the launching of a scientific theory.
A vicious smear campaign aimed at discrediting both Velikovsky and his

Harlow Shapley -- "if Dr Velikovsky is right then the rest of us are crazy."

work was started by a small but powerful clique of scientists, most of whom, at the time, had not even read any of his books, and who were later described by the great Italian probability theorist de Finetti as " a despotic and irresponsible Mafia."
Chief among the villans in this unsavoury episode was the eminent astronomer, Dr Harlow Shapley, then director of the Harvard College Observatory.
As far back as 1946, four years before the publication of "Worlds in Collision", Velikovsky had approached Shapley with a request for assistance in searching for signs of hydrocarbons in the spectral emissions of light from Venus.
At the time, the conventional astronomical wisdom was that Venus was quite a cool place, with a surface temperature just above that of Earth.
Velikovsky's theory, on the other hand, implied that Venus would be found to be very hot, due to its relatively recent formation from Jupiter.
Conventional theory at that time also held that the atmosphere of Venus was composed mainly of carbon monoxide: but Velikovsky asserted that it would be found to be rich in hydrocarbons.
Velikovsky had openly declared that if indisputable evidence of both the temperature and the atmospheric composition of Venus could be brought forward, it would provide two crucial tests of the validity or otherwise of his theories.
But Shapley refused Velikovsky's request on the grounds that " if Dr Velikovsky is right then the rest of us are crazy", despite the fact that the request had been backed up by another leading academic, Prof Horace M Kallen, now professor emeritus of Philosophy at the Graduate Faculty of the New School of Social Research.
With Shapley's refusal, coupled with similar refusals from Walter S Adams of Mount Wilson Observatory and Rupert Wildt at the Mc Cormick Observatory, Velikovsky was unable to put his theories to the test.
Nevertheless, he felt so sure of the essential validity of his work that he stuck his neck out and left the controversial predictions about Venus in the final manuscript for "Worlds in Collision".
In the summer of 1947, after a dozen publishing houses had rejected the manuscript, mainly on the grounds that it was too scholarly, the Macmillan company, which had a very strong academic textbook division, signed an optional contract to publish the book.
During the next two and a half years, as the leisurely process of academic publishing proceeded, the manuscript was read, and approved, by a number of authoritative referees. Notable among them was Gordon Atwater, then Curator of the Hayden Planetarium and Chairman of the Department of Astronomy at the American Museum of Natural History. Atwater would later have cause to regret his endorsement.
Early in 1950, a number of popularised versions of Velikovsky's theories, based on condensations of the galley proofs of "Worlds in Collision", appeared in magazines like Harpers, Readers' Digest , and Colliers' Magazine.
About the same time, Shapley, who still had not read "Worlds in Collision", wrote to Macmillans expressing astonishment that the company was dabbling in the "black arts", and threatening to "cut off" all relations between himself and Macmillan if the book's publication went ahead.
Somewhat alarmed by this broadside, Macmillan's president George Brett told Shapley he would once again submit the manuscript for final approval to three impartial censors, and would abide by their decision.
The censors, however, having duly read the book, said they approved of its publication, and "Worlds in Collision" made its appearance in early April, 1950.
But Shapley and his associates had been far from idle in the weeks that preceded publication.
Before "Worlds in Collision" had even gone to press, the Febrary issue of Science News Letter, of which Shapley was at that time in charge, carried five denunciations of Velikovsky's ideas by five experts, including (you guessed), Harlow Shapley.
And in March, the Reporter published a sarcastic critique by Shapley's astronomer colleague, Cecilia Payne-Gaposchkin in which she claimed to refute Velikovsky's theories -- as she understood them from one of the popularisations, an article called "The Day the Sun Stood Still" by Eric Larabee of Harpers.
By some strange coincidence, the March issue of Shapley's Science News Letter- recommended all scientists to read Mrs Gaposchkin's critique, describing it as " a detailed scientific answer to Dr Velikovsky."
In the middle of March, Dr Otto Struve, then Director of the Yerkes Observatory at the University of Chicago, wrote to John O'Neill, then Science Editor of the New York Herald Tribune , asking him to withdraw his endorsement of "Worlds in Collision" --- O'Neill had read the manuscript and described it in his column as " a stupendous panorama of terrestrial and human histories which will stand as a challenge to scientists to frame a realistic picture of the cosmos."
Struve also wrote to Gordon Atwater, the Hayden planetarium director who had earlier recommended to Macmillans that the book be published, asking him to withdraw his recommendation.
Atwater, unaware of what was to follow, wrote back in reply that, far from abandoning "Worlds in Collision", he was planning a programme on the book to be shown at his planetarium.
It can hardly be coincidental that a couple of weeks later he was fired from his post.
Neither can it be just a coincidence that in the Herald Tribune of April 2, John O'Neill's scheduled review of "Worlds in Collision" was omitted and a derogatory review by Struve substituted. Struve's ignorance of Velikovsky's views can be judged by his commendation to Tribune readers of a passage in Gaposchkin's equally ill-informed Reporter article in which she denounced Velikovsky's theory of " a comet turned into a planet" as absurd because there are observations of of Venus which date back to 500 years before the Exodus, when Velikovsky's catastrophes were said to have occurred.
Since neitherStruvenor Gaposchkin had actually read "Worlds in Collision", they were unaware that Velikovsky had gone to some pains to deal with that very objection. In his book he had pointed out that scholars dispute the dates of the astronomical records of Venus (the "Venus Tablets of Amizaduga" discovered in the ruins of the ancient Babylonian city of Niniveh) that Gaposchkin was referring to.
Furthermore, even if the conventional dating of these records is correct, the motions of Venus they describe are so erratic and uncharacteristic of planetary behaviour that they have puzzled astronomers ever since their discovery, and support rather than contradict the suggestion that Venus was originally a comet.
Shapley, Gaposchkin and Struve were by no means Velikovsky's only detractors.
During 1950, " a surprising number of the country's reputable astronomers descended from their telescopes to denounce "Worlds in Collision"," according to the Harvard Crimson of September 25th. Most of their reviews were either abusive or ill-informed , or both.
But in spite of all this hostile propaganda from the big guns of science -- or perhaps because of it -- "Worlds in Collision" shot to the top of the American best-seller lists and stayed there for 20 weeks.
Unfortunately for Velikovsky, however, the academic establishment did not confine its activities merely to sniping at him in public.
Only a month or so after the publication of "Worlds in Collision", Velikovsky was urgently summoned to the president's office at Macmillans to see Brett, who, far from being delighted at the book's runaway success, was more than a little worried.
Explaining the peculiar vulnerability of textbook publishers to pressure from the doyens of the academic world, he told Velikovsky how professors at a number of Universities were refusing to see Macmillan salesmen, and how the company was receiving letters from scientists demanding that publication of "Worlds in Collision" should cease forthwith.
These same academics, Brett stressed, could easily ruin Macmillan's reputation by such simple tactics as refusing to recommend Macmillan textbooks to their students, and refusing to submit manuscripts for publication by the company. He begged Velikovsky to agree to transfer the book to the Doubleday company, which had no textbook department and which was therefore immune to professorial blackmail.
After receiving assurances from Doubleday that it would not bow to similar pressures, Velikovsky agreed to the transfer.
But the criticism continued unabated.
And, what was worse, it was accompanied by more back-stabbing.
James Putnam, who had been trade books editor at Macmillan for 25 years and was the man who had originally recommended the publication of "Worlds in Collision", was summarily dismissed from the company as soon as the transfer to Doubleday, which had been negotiated without his knowledge, was complete.
Here in Britain, the critics were a little more polite than in the USA, but no less damning.
Sir Harold Spencer Jones, then Astronomer Royal, lamented in the Spectator :
"It is a pity that so much erudition should have been wasted in following so false a trail." And JBS Haldane in the New Statesman denounced "Worlds in Collision" as "equally a degradation of science and religion." Curiously, Haldane seemed to see the book, with its tales of catastrophes, as part of some great American plot to soften up the world for a nuclear war.
One could go on and on at great length listing all the unfair misrepresentations of Velikovsky's ideas, and detailing all the hostile denunciations, usually based on misconceptions, that have appeared over the years.
Even that famous epitome of scientific responsibility, the Bulletin of the Atomic Scientists, allowed a journalist who had no knowledge of the subject to deride Velikovsky's views on Egyptology in its pages, and then refused to allow Velikovsky the right to reply.
But what is more important is to show how, even as the critics continued their barrage, the scientific evidence was beginning to build up in favour of many of Velikovsky's ideas-- ideas that had seemed unthinkable when he first announced them.

Velikovsky's "make or break" predictions -- that Venus would be found to be hot and to have a hydrocarbon atmosphere -- have already been mentioned.
When Mariner II flew by Venus in December 1962, it radioed back that the planet had a surface temperature of more than 800°F, so confirming reports by radio astronomers in 1961 that Venus' temperature is greater than 600°F.
The Mariner II results, in the interpretation of NASA and the Jet Propulsion Laboratory, also showed that the atmosphere of Venus contains carbohydrates and hydrocarbons, as well as carbon dioxide.
Another central idea in Velikovsky's work is that electromagnetic phenomena play a very significant role in the dynamics of the Solar system, and of the universe in general.
Back in 1950, the notion that space was anything other than a vacuum, devoid of plasmas or magnetic fields, was regarded as preposterous. Even Einstein, who was sympathetic to Velikovsky and conceded that many of his propositions could well be valid, found the notion of an electromagnetically interacting universe too much to swallow.
But 10 years later Pioneer V -- man's first deep-space probe -- shattered these illusions of "empty space". when it discovered the Van Allen radiation belts, extraterrestrial magnetic fields, and a vast sea of energetic particles swirling about in the cosmos.
Donald Menzel, a Harvard associate of Shapley', ridiculed Velikovsky's theories in 1952 by demonstrating that if they were true the Sun would have to have an electrostatic charge of the order of

10^{19} volts. It is ironic to say the least that eight years later Prof Bailey of Sydney University concluded in Nature that the Sun must carry a negative charge of 10^{19} volts.

In 1953, Velikovsky suggested at Princeton Graduate College that Jupiter would be found to emit radio noises. 18 months later, Burke and Franklin of the Carnegie Institute announced their unexpected discovery of strong radio signals emanating from Jupiter.

Evidential support for Velikovsky's belief that a large comet has been in collision with the Earth is found in the work of Worzel and Ewing of Columbia University who wrote in 1959 in the Proceedings of the National Academy of Sciences that the existence of an evenly-distributed layer of white ash covering the oceans' floors suggests a "cometary collision", or is the result of the "fiery end of bodies of cosmic origin". Such a collision, they added, "could hardly be without some recorded consequences of Global extent."

It is now accepted that the Earth's magnetic field has reversed in polarity several times in past eras. Physicists Durrani and Khan suggested in Nature in 1972 an explanation similar to Velikovsky's -- that there has been magnetic interaction between the Earth and an external body. Also in Nature, Kennet and Watkins pointed out in 1970 the correlation between magnetic polarity changes and the widespread destruction of fauna, changes in climate, and maxima of volcanic activity.

Velikovsky's view that the Earth's petroleum deposits may be partly of cosmic origin was supported by A T Wilson in an article in Nature in October 1962.

The prediction in "Worlds in Collision" that human settlements would be found "on the Kolyma or Lena rivers flowing into the Arctic Ocean" was vindicated by A P Okladnikov who in "Vestiges of Ancient Culture" described the discovery of settlements on the Kolyma river, in ground now permanently frozen.

In 1964, Velikovsky wrote to Dr Elizabeth Ralph of the University of Pennsylvania suggesting that seeds and short-living plants like reeds and papyrus from the tomb of Tutankhamen should be subjected to radiocarbon tests, and stating his belief that they would be found to have originated in about 840BC. The accepted date for Tutankhamen's death is 1350BC. It was not until the spring of 1971 that the British Museum's radiocarbon laboratory performed tests on palm kernels and reeds from the tomb. They estimated the date of origin of the samples as 899BC.

Another of Dr Velikovsky's suggestions, that the Mesoamerican culture is several centuries older that the date assigned to it in traditional chronology, is now supported by Mac Neish (Scientific American, November 1964) and Drucker et al (Science, July 12, 1957).

On the day of the first Appollo moon landing, July 21, 1969, an article by Velikovsky titled "Are the Moon's Scars Only 3000 Years Old?" was published in the New York Times. In the article, as in several earlier memoranda to the then Chairman of the US National Academy of Science's Space Science Board, H H Hess, Velikovsky put forward the idea that the moon's rocks "could conceivably be rich in remanent magnetism" even though the moon has a very weak overall magnetic field.

On May 19, 1969, he wrote to Hess:" The moon was repeatedly heated and its entire surface melted less than 35 and 27 centuries ago .. .. it was enveloped in powerful magnetic fields. If the surface cooled below the Curie point before the magnetic fields were weakened and removed, then it is to be expected that lavas on the moon (most of its rocks are lava) still possess a high magnetic remanence."

His prediction was confirmed a few months later when the Lunar Sample Preliminary Examination Team reported in Science (Sept 19,1969) that "natural remanent magnetisation has been found in the crystalline rocks ... the result of processes not yet understood."

This discovery has formed a subject for controversy at several recent conferences on Lunar science, but no one has come up with a satisfactory explanation. There is still, however, an almost unanimous refusal among experts to discuss Velikovsky's theories as a possible solution to the problem.

But this reluctance is no longer universal. Velikovsky's name is slowly but surely being cleared, especially among students and those who do not have vested intellectual interests that blind them to the obvious merit of his work.

The cold shoulder he used to receive from Universities in the Fifties has gradually thawed into a warm welcome on college campuses all over the United States.

In February this year, for instance, he addressed a large and enthusiastic audience at Harvard -- ironically, the very place from which his critics used to make their bitterest and most scornful pronouncements. A few days later, the Canadian Broadcasting Corporation screened a one-hour TV special about him.

In May, Pensee, the magazine of the Student Academic Freedom Forum, published a complete issue devoted to Velikovsky and his work, and in late August the Student Academic Freedom Forum staged a three-day Velikovsky symposium at Lewis and Clark College, Portland, Oregon.

We gratefully acknowledge the assistance of Pensee in the preparation of this article, and we hope to carry a report of the Velikovsky symposium in the next issue of UNDERCURRENTS. Equally indispensable to the student of Velikovsky's work is "The Velikovsky Affair" edited by Alfred de Grazia, publisher of the American Behavioural Scientist, which has been almost unique among academic journals in its support for Dr Velikovsky's right to be heard. The book is published in the UK by Sidgwick and Jackson.

Though we haven't seen it, "Lunar Probes and Velikovsky's Advance Claims," which can be had from Cosmos and Chronos, PO Box 12807, Fort Worth, Texas, should be worth reading.

Sidgwick and Jackson also publish Velikovsky's "Oedipus and Akhnaton", "Ages in Chaos", and , in collaboration with Victor Gollancz, "Earth In Upheaval". Gollancz also publish the book that started it all, "Worlds in Collision", but this is now available in paperback form from Sphere books (Abacus edition).

Velikovsky's four major works are filled to the brim with an immense volume of supporting data that far outweighs the evidence set forth in this article, where we have attempted only to give a sketch of his ideas and to list just some of the corroborating discoveries that have emerged since the original books were written, between 12 and 22 years ago.

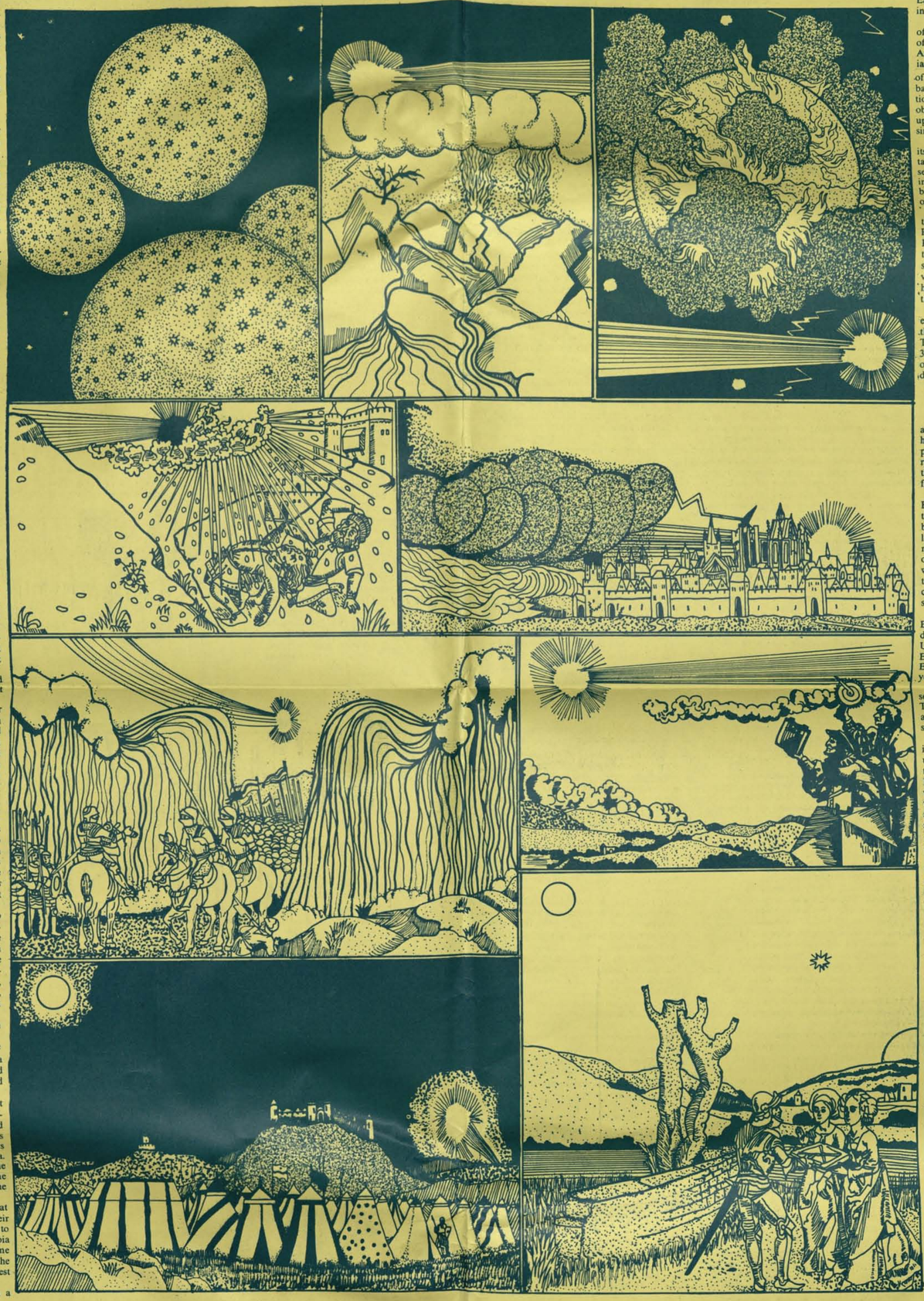
It is no longer possible for the unbiassed observer to deny that Velikovsky's work is worthy of serious consideration, and merits a considerable amount of further research. There may, of course, turn out to be major flaws in his arguments. Velikovsky himself has never denied the possibility. But any flaws that may exist will be uncovered by a painstaking examination of all the available evidence, old and new, and not by a bigoted refusal to discuss his theories because they would send too many scientists back to their drawing boards if they were true.

Irrespective of the ultimate fate of Velikovsky's ideas, however, the story of his character assasination will go down in history as the classic example of the scientific establishment's dogmatic narrow mindedness -- a characteristic admirably summed up by Galileo when he wrote of his opponents:

"There remain in opposition to my work some stern defenders of every minute argument of the Peripatetics. So far as I can see, their education consisted in being nourished from infancy on the opinion that philosophising is and can be nothing but to make a comprehensive survey of the texts of Aristotle, that from divers passages they may quickly collect and throw together a great number of solutions to any proposed problem. They wish never to raise their eyes from those pages -- as if this great book of the Universe had been written to be read by nobody but Aristotle, and his eyes had been destined to see for all posterity."

VELIKOVSKY

Dr Velikovsky manifests a strong distaste for summaries and popularisations of his books. In the past, many erroneous criticisms of his work have been based on such popularisations, the critics never having studied the originals. Velikovsky's books, detailed in their argument and exhaustive in their documentation, do not easily lend themselves to summarisation. The following scenario is intended only to provide a glimpse of the events described in "Worlds in Collision" and "Earth in Upheaval". Shorn of supporting evidence, these events must seem fanciful and improbable. Readers are strongly urged to study both books very carefully before coming to premature conclusions. The text is taken from the special "Pensee" issue on Velikovsky, dated May 1972. The illustrations were drawn specially for UNDERCURRENTS by John Cima, who based his style on a Medieval depiction of Biblical events contained in the Cologne Bible.



Global cataclysms fundamentally altered the face of our planet more than once in historical times. The terrestrial axis shifted. Earth fled from its established orbit. The magnetic poles reversed.

In great convulsions, the seas emptied onto continents, the planet's crust folded, and volcanos erupted into mountain chains. Lava flows up to a mile thick spilled out over vast areas of the Earth's surface. Climates changed suddenly, ice settling over lush vegetation, while green meadows and forests were transformed into deserts.

In a few awful moments, civilizations collapsed. Species were exterminated in continental sweeps of mud, rock and sea. Tidal waves crushed even the largest beasts, tossing their bones into tangled heaps in valleys and rock fissures, preserved beneath mountains of sediment. The mammoths of Siberia were instantly frozen and buried.

Surviving generations recorded these events by every means available: in myths and legends, in temples and monuments to the planetary gods, precise charts of the heavens, sacrificial rites, astrological canons, detailed records of planetary movements, and tragic lamentations amid fallen cities and destroyed institutions.

"ALL IS RUIN"

Aware of a link between the circuit of heavenly bodies and the catastrophic ruin of previous generations, the ancients ceaselessly watched the planetary movements. Their traditions recalled that when old epochs dissolved, the new "age" or "sun" was marked by different celestial paths. Astronomers and seers diligently watched for any change which might augur approaching destruction and the end of an age.

Prior to the second millenium B.C. ancient Hindu records spoke of four visible planets, excluding Venus. Babylonians, meticulous in their observations, likewise failed to notice Venus.

But some time before 1500 B.C. Jupiter, for centuries chief among the deities, shattered the serenity of the skies. A brilliant, fiery object, expelled from that planet, entered upon a long, elliptical orbit around the sun. The feared god Jupiter had given birth to the comet and proto-planet, Venus.

Terrified, men watched the "bright torch of heaven" as it traversed its elongated orbit, menacing the Earth at each pass. Venus, a Chinese astronomical text recalls, spanned the heavens, rivalling the sun in brightness. "The brilliant light of Venus," records an ancient rabbinical source, "blazes from one end of the cosmos to the other."

The fears of the star-watchers were justified. As Venus arched away from its perihelion during the middle of the second millenium B.C. (ca. 1500), the Earth approached this intruder, entering first the outer reaches of its cometary tail. A rusty ferrous dust filtered down upon the globe, imparting a bloody hue to land and sea. The fine pigment chafed human skin, and men were overcome by sickness. Those who sought to drink could not. Rivers stank from the rotting carcasses of fish, and men dug desperately for water uncontaminated by the alien dust. "Plague is throughout the land. Blood is everywhere," bewailed the Egyptian, Ipuwer. "Men shrink from tasting, human beings thirst after water. . .That is our water! That is our happiness! What shall we do in respect thereof? All is ruin."

As recalled by the Babylonians, the blood of the celestial monster Tiamat poured out over the world.

But as the Earth's path carried it ever more deeply into the comet's tail, the rain of particles grew steadily more coarse and perilous. Soon a great hail of gravel pelted the Earth. "There was hail, and fire mingled with hail, very grievous, such as there was none like it in all the land of Egypt since it became a nation." So recorded the author of *Exodus*.

Fleeing from the torrent of meteorites, men abandoned their livestock to the holocaust. Fields of grain which fed great cities perished. Cried Ipuwer, "No fruits, no herbs are found. That has perished which yesterday was seen. The land is left to its weariness like the cutting of flax." These things happened, say the Mexican *Annals of Cuauhtitlan*, when the sky "rained, not water, but fire and red-hot stones."

As our planet plunged still deeper into the comet's tail, hydrocarbon gases enveloped the Earth, exploding in bursts of fire in the sky. Unignited trains of petroleum poured onto the planet, sinking into the surface and floating on the seas. From Siberia to the Caucasus to the Arabian desert, great spills of naphtha burned for years, their billows of smoke lending a dark shroud for human despair.

Our planet was pursuing a near collision course with the massive comet's head.

Suddenly, caught in an invisible grip, the Earth rocked violently; its axis tilted. In a single convulsed moment, cities were laid waste, great buildings of stone levelled, and populations decimated.

"The towns are destroyed. Upper Egypt has become waste. . .All is ruin. . .The residence is overturned in a minute." Around the world, oceans rushed over mountains and poured into continental basins. Rivers flowed upward. Islands sank into the sea. Displaced strata crashed together, while the shifting Earth generated a global hurricane which destroyed forests and swept away the dwellings of men.

In China waters "overtopped the great heights, threatening the heavens with their floods." Decades of labor were required to drain the valleys of the mainland. Arabia was transformed into a desert by the same paroxysms which may have dropped the legendary Atlantis beneath the ocean west of Gibraltar.

With dulled senses, survivors lay in a trance for days, choking in the smoky air.

The tilting axis left a portion of the world in protracted darkness, another in extended day. From the Americas to Europe to the Middle East records tell of darkness persisting for several days. On the edge of the darkness, the peoples of Iran witnessed a threefold night and a threefold day. Chinese sources speak of a holocaust during which the sun did not set for many days and the land was aflame. Peoples and nations everywhere, uprooted by disaster, wandered from their homelands.

CELESTIAL DRAGON

Led by Moses, the Israelites fled the devastation which brought Egypt's Middle Kingdom to an end. As they pushed toward the Sea of Passage, the glistening comet, in form like a dragon's head, shone through the tempest of dust and smoke. The night sky glowed brightly as the comet's head and its writhing, serpentine tail exchanged gigantic electrical bolts.

The great battle between the fiery comet's head and the column of smoke – between a light-god and a leviathan serpent – was memorialized in primary myths around the Earth. Babylonians tell of Marduk striking the dragon Tiamat with bolts of fire. The Egyptians saw Isis and Seth in deadly combat. The Hindus describe Vishnu battling the "crooked serpent." Zeus, in the account of Appollodorus, struggled with the coiled viper Typhon.

The fugitive Israelites, having reached Pi-ha-Khiroth at the edge of the Red Sea, were pursued by the pharoah Taoui-Thom. The great sea lay divided before the slave people, its waters lifted by the movement of the Earth and the pull of the comet. Crossing the dry sea bottom, the Israelites escaped from Egypt.

As the comet made its closest approach to Earth, Taoui-Thom moved his armies into the sea bed. But even before the entire band of Israelites had crossed to the far side, a giant electrical bolt flew between the two planets. Instantly the waters collapsed. The pharoah, his soldiers and chariots, and those Israelites who still remained between the divided waters were cast furiously into the air and consumed in a seething whirlpool.

The battle in the sky raged for weeks. A column of smoke by day, a pillar of fire by night, Venus meted destruction to nations large and small. To the Israelites, it was an instrument of national salvation.

Through a series of close approaches, the comet's tail, a dreadful shadow of death, fractured the Earth, wreathing the planet in a thick, gloomy haze that lasted for many years. And so, in darkness, a historical age ended.

Possibly the human race would have become extinct, but for a mysterious, life-giving substance precipitated in the heavy atmosphere – the nourishing "manna" and "ambrosia" described in the ancient records of all peoples. It fell with the morning dew, a sweet, yellowish hoar frost. It was edible. The ambrosial carbohydrates, possibly derived from Venus' hydrocarbons through bacterial action, filled the atmosphere with a sweet fragrance. Streams flowed with "milk and honey." When heated, this "bread of heaven" dissolved, but when cooled, it precipitated into grains which could be preserved for long periods or ground between stones. Its presence allowed man and beast to survive.

In the new age the sun rose in the east, where formerly it set. The quarters of the world were displaced. Seasons no longer came in their proper times. "The winter is come as summer, the months are reversed, and the hours are disordered," reads an Egyptian papyrus. The Chinese Emperor Yahou sent scholars throughout the land to locate north, east, west, and south and draw up a new calendar. Numerous records tell of the earth "turning over." An Egyptian inscription from before the tumult says that the sun "riseth in the west."

While men attempted to determine the times and seasons, Venus continued on its threatening course around the sun. Under Joshua, the Israelites had entered the Promised Land, and again Venus drew near. It was while the Canaanites fled from before the hand of Joshua in the valley of Beth-horon – some 50 years after the Exodus – that the daughter of Jupiter unleashed her fury a second time. "The Lord cast down great stones from heaven upon them unto Azekah, and they died." The terrestrial axis tilted. Once more the Earth quaked fiercely. Cities burned and fell to the ground. Above Beth-horon the sun stood still for hours. On the other side of the Earth chroniclers recorded a prolonged night, lit only by the burning landscape. This occurred, Mexican records report, about 50 years after an earlier destruction.

As in its first encounter with the young comet, the Earth's surface was torn with great rifts and clefts, and hurricanes scoured the land. Strata pressed against strata, rising thunderously into mountains or engulfing cities. But the Earth and some of its inhabitants survived.

Anticipating renewed devastation following another 50-year period, nations bowed down before the great fire goddess. With bloody orgies and incantations they enjoined the dreaded queen of the planets to remain far removed from the human abode. "How long wilt thou tarry, O lady of heaven and earth?" inquired the Babylonians. "We sacrifice unto Tistrya," declared a priest in Iran, "the bright and glorious star, whose rising is watched by the chiefs of deep understanding."

MARS

In both hemispheres men fixed their gaze anxiously on the comet as, for centuries, it continued its circuit, crossing the orbits of both Earth and Mars. Before the middle of the eighth century B.C., astrologers observed dramatic irregularities in its wanderings. Viewed from Babylonia, Venus rose, disappeared in the west for over nine months, then reappeared in the east. Dipping below the eastern horizon, it was not seen again for over two months, until it shone in the west. The following year Venus vanished in the west for eleven days before reappearing in the east.

But this time it was Mars, not Earth, that endured a cosmic jolt. Passing by the smaller orb, Venus pulled Mars off its orbit, sending it on a path that endangered the Earth. A new agent of destruction was born in the unstable solar system.

This occurred in the days of Uzziah, King of Jerusalem. (Lucian, the *Bamboo Books* of China, the Hindu *Surya-Siddhanta*, the Aztec Huitzilopochtli epos, the Indo-Iranian *Bundahis*, etc., describe the reordering of Mars' and Venus' orbits.) Aware of the baleful meaning of irregular celestial motions, the prophet Amos, echoed by other observers of the sky, warned of new cosmic upheavals. Events soon vindicated the pessimistic seers.

As Mars drew near, the Earth reeled on its hinges. West of Jerusalem, half a mountain split off and fell eastward; flaming seraphim leaped skyward. Men were tossed into streets filled with debris and mutilated bodies. Buildings crumbled and the Earth opened up.

These cataclysms were associated with the founding of Rome (placed by Fabius Pictor at 747 B.C.) and with the death of Rome's legendary founder, Romulus. "Both the poles shook," Ovid relates, "and Atlas shifted the burden of the sky. . .The sun vanished and rising clouds obscured the heaven. . ." Mars, the lord of war, became the national god of Rome.

Much smaller than Earth, Mars could not equal Venus in destructive power. But again the Earth altered its course around the sun. The old calendar, with 360-day years and 30-day months, became outdated. Emperors and kings directed their astrologers to develop a new calendar.

BATTLE OF THE GODS

Mars and Venus now competed for the allegiance of men. Tribes moved from their homeland, confronting new enemies while petitioning Mars or Venus for a swift victory. Cities and temples were dedicated to the two planetary gods who determined the fate of nations.

The era of conflict between Mars and Earth and between Mars and Venus continued until 687 (or possibly 686) B.C. Hebrew prophets after 747 B.C. cried apocalyptically of upheavals yet to come. Reminding the Israelites of their passage out of Egypt, they declared that once more the whole Earth would quake, the moon turn to blood, the sun darken and the Earth be consumed in blood, fire and pillars of smoke.

The catastrophe, as Mars hurtled past the Earth, came in the year 721 B.C., on the day Jerusalem's King Ahaz was buried. Under the influence of Mars' passage, the Earth's axis tilted and the poles shifted. Earth's orbit swung wider, lengthening the year.

Israelites observed the sun hastening by several hours to a premature setting. Thereafter, the solar disc made its way across the sky 10 degrees farther to the south.

Seneca records that on the Argive plain in Greece the early sunset came amid great upheaval. The tyrant Thyestes beckoned the entire universe to dissolve. The Great Bear dipped below the horizon. In the days which followed, states Seneca, "The Zodiac, which, making passage through the sacred stars, crosses the zones obliquely, guide and sign-bearer for the slow-moving years, falling itself, shall see the fallen constellations."

Once a peaceful, barely noticed planet, but now the "king of battle," Mars was still not finished with his work of destruction. In 687 B.C. a powerful Assyrian army led by Sennacherib marched toward Judah. On the evening of March 23, the first night of the Hebrew Passover, when Sennacherib and his army camped close to Jerusalem, Mars made a last, fateful approach to the Earth. A great thunderbolt – a "blast from heaven" – charred the soldiers' bodies, leaving their garments intact. The dead numbered 185,000. Assurbanipal, Sennacherib's grandson, later recalled "the perfect warrior" Mars, "the lord of the storm, who brings defeat."

The same night of March 23, 687 B.C., in China, the *Bamboo Books* reveal that a disturbance of the planets caused them to go "out of their courses. In the night, stars fell like rain. The Earth shook." Romans would celebrate the occasion: "The most important role in the (Roman) cult of Mars appears to be played by the festival of *Tubilustrium* on the twenty-third day of March."

The sun retreated by several hours. In certain longitudes the solar disc, which had just risen, returned below the horizon. In others, the setting sun retraced its course, rising in the sky. The Hebrews witnessed the prolonged night of Sennacherib's destruction.

The sun's retreat, due to a 10 degree tilt of the earth's axis, corrected the axis shift of 721 B.C. "So the sun returned ten degrees, by which degrees it was gone down," reads *Isaiah* 38.8.

From one continent to another men, oppressed with terror, watched Mars battle Venus in the sky, speed fiercely toward the Earth bringing blasts of fire, retreat and engage Venus once more. Perhaps the most startling literary account of this *theomachy*, or battle of gods, is contained in Homer's *Iliad*. (Velikovsky's revised chronology places Homer later than 747 B.C.) As the Greeks besieged Troy, Athena (Venus) "would utter her loud cry. And over against her spouted Ares (Mars), dread as a dark whirlwind. . .All the roots of many-founted Ida were shaken, and all her peaks." The river "rushed with surging flood" and "The fair streams seethed and boiled."

Venus emerged from the battle defeated, a tame planet pursuing a near circular orbit between Mercury and Earth. Where once it ranged high to the zenith, now it became the morning and evening star, never retreating more than 48° from the sun. Isaiah, who had witnessed the planet's destructive power, sang of its disgrace: "How art thou fallen from heaven, O Lucifer, son of morning! How art thou cut down to the ground, which didst weaken the nations! For thou hast said in thine heart, I will ascend into heaven, I will exalt my throne above the stars of God."

greenpeace

paul wesley

In recent years we have been bombarded with a great deal of information about the ecological catastrophe that the world is heading towards. We now know about our population increasing by 72 millions each year; about persistent use of DDT that kills birds and fish and will continue to do so for years even after we finally decide to ban its use completely; about industrial and urban refuse turning rivers and whole lakes into open sewers, now threatening even the oceans; and as natural resources dry up we can watch the mad scramble to find more, encroaching upon our National Parks, the sea-beds and valuable farm lands.

A recent doomsday prediction, from the Club of Rome, gave "civilisation" only 100 years before total collapse. All such predictions have been accompanied by demands for a radical change in our approach to industrial growth, population, agriculture and other basics of life style. The present-day crises are, in fact, relatively minor warnings of a greater catastrophe ahead. . . . But what can we do?

Near to the heart of the matter is the question of "growth". Throughout the world we talk of it, and strive for it. Yet clearly, infinite growth cannot be sustained by finite resources. Even if Britain, for example, were to bring an immediate halt to any increase in its standard of living, there would not be enough resources to ever allow the developing world to reach the same standard. We must add to this the fact that today's technology has as its most important end result, more and more pollution and destruction of the environment.

But when we talk of our local environment, we must also bear in mind that in many ways there is only one environment—what happens to a part, affects the whole. Poisonous substances such as mercury, lead and DDT, which penetrate the food chain, have been found in fish and birds far removed from the origins of the poisons; industrial smog from Britain affects the countryside of southern Sweden; the extinction of an animal species and the resultant break in the ecological cycle on a distant continent, supplies the furriers on our High Street.

A major part of the solution must therefore lie in the day to day life style of each individual. For example, we all accept too easily the "necessity" to define ourselves by what we possess; the size and colour of a TV screen, the range of kitchen gadgets, the virility symbol of a car, the latest fashions in clothes. On a larger scale, developing nations accept that they must define themselves by the size of their military parades and hardware. But the things of the TV commercial and the military overkill are not the things of Life—they are in a very real sense anti-Life.

If to ensure our future is to be selfish, then that is basically what we have to be—self and Life affirming.

We cannot depend on governments to make anything more than occasional token gestures. We haven't the time to wait for "The Revolution" to come and solve the problem. We must not look to technology to tackle its own pollution problems—by making anti-pollution machines. We cannot leave it to the next generation to deal with, for even if we could stand their curses in our old age, we really do not have that long.

What we can do is to start acting for ourselves in our everyday lives and start developing our understanding of what has to be achieved. The major destroyers of the environment depend upon our support for their continued existence, whether they are the makers of non-returnable bottles or non-returnable fall-out. We can learn to criticise and then to oppose the social myths of "growth", "progress" and "development"—to end the "I want" needless consumption where need equals greed. This is something that must be done by us, the affluent. It's no use telling the poor to lower their sights. They will justifiably retort "How can you expect us to reject what you taught us to seek and what we've never had?" It is the affluent who must show by example and who must re-create non-destructive standards.

We can bring this into our everyday lives now. Rather than just a rejection of the state of affairs as they exist, we have to start taking the future into our own hands. More and more people are moving in this direction. It is not of course enough to concentrate on putting our own house in order while neglecting direct action against the larger political/business concerns. These continue to destroy our environment in many ways, from concrete swathes of motorway madness to mercury discharges in our waterways, and they must be confronted. In other words, personal action should inevitably lead to local community action. The bureaucracies of organisation will break down to a human scale once again, the Community will re-assume greater importance than the State, husbandry will replace industry, and craftsmanship, mass manufacture. As we lose the idea that Man must assert domination over Nature, we will forget that man used to dominate over man.

The following ideas concentrate on the simple nonviolent tactic of daily withdrawing support from that which destroys Life. It is by no means a complete list and deals mainly with personal action rather than larger-scale social/political action. All are doors to further action and greater awareness but they are not rules to prove a radical commitment, merely a direction. They must be added to and developed. As you discover new alternatives, big or small, please share them with people and help each other change the course that the world is presently on.

you and your environment— a new way of life

★ It's time to cultivate an awareness of ourselves, not merely as skinbound individuals threatened by the rest of the world but as integral parts of the entire planet inseparable from every other biological and geological process.

★ The population explosion is your baby. If you have to have more than two children, then adopt them. It has been estimated that a child born in Britain will, on average, consume during her or his lifetime at least 20 times as much as one born in India and contribute 50 times as much pollution to the environment. In ecological terms therefore the developed countries are the most dangerously overpopulated. Help all efforts at disseminating birth control information at home, in the streets, in schools. Support campaigns for better birth control methods—especially for men.

★ Stop smoking—an important personal commitment to stop polluting your own body, not to mention the air for others. Also a great deal of good land is wasted in the growing of tobacco.

★ Discover ways to stop using cars, or at least to cut their use to an absolute minimum. Change right away to a much greater use of bicycles. If you find yourself being choked and poisoned by car fumes in the city, wear a gas mask occasionally as a practical protest; do this with lots of people for an anti-car demonstration. Try walking more. If you still need a car never use it just for one person, always share. If the Car God could be effectively challenged, the result in terms of human sacrifice, air pollution and oil resources would improve many areas of human existence.

★ As an interim stage encourage the development of a free, and greater use of the existing, public transport. But remember that although trains use 1/10th and buses 1/5th the fuel that cars do, they still cause a great deal of waste and pollution. What is really needed is a move towards much more local living and production, a demystification of the ideal of mechanical movement for its own sake, and a return to a slower speed of life.

★ Work to get cars banned from residential streets. Turn them into play and rest areas for the people living there instead of brain-damaging lead poison zones. Traffic-free shopping areas are also important. Help noise abatement groups in their work against excessive traffic noise.

★ If you eat plant matter direct it gives the maximum amount of energy and nutriments, but if it is first eaten by an animal and you then eat that animal, its flesh will provide much less food than the plant matter that fattened it. (eg a cow needs 21 lbs of protein to produce 1 lb of protein for human consumption.)

Also, a very large proportion of our meat is now produced in factory farms. In 1970 over 300 million broiler chickens were produced in machines and now battery cages for pigs and rabbits are being introduced. Nearly all veal is produced in this horrible fashion. Help campaign to end this. Eat less meat. Become a vegetarian.

"You are what you eat" is probably a better maxim to live from than "You are what you possess".

★ Grow your own food and avoid the use of artificial fertilisers. Start a compost heap for kitchen and organic wastes. Rather than weighing down the dustbin man composts can be used to replenish the earth, returning some of the nutriments removed during plant growth. Compost is the most complete and revitalising and least expensive additive that a garden can receive. Artificial fertilisers may give short term benefits but

have proved in the long run to be destructive of the soil and of natural waters.

★ Do without disposables. The manufacturers of disposable products encourage a vision of the future where kitchenware, then clothes, then even houses will be disposable. But nothing is truly disposable. In particular, paper, plastics and metals come from limited resources put aside by nature and not intended for careless and massive exploitation and irretrievable loss. Making disposables increases the destruction of these resources and the thrown away products then destroy the environment.

★ Start a household campaign to see how little you can throw into the dustbin.

★ Conserve energy: use as few electrical devices as possible, many are really unnecessary and for others there are man-powered alternatives. It is also possible to develop the use of non-polluting power sources, such as wind, water and sun, sufficient to our needs—especially when we cut down on our "needs".

★ Share with friends and neighbours any electrical appliances that still seem essential, such as washing machines, power tools . . . and electric toothbrushes.

★ Turn off the lights when not in use: open curtains and blinds to let in as much natural light as possible; replace high wattage bulbs with low wattage ones where such intense light is not needed. "Turn off your lights—in the silence of your room you can hear a thousand rivers and the earth whispering their thanks."

★ Radioactive particles from peaceful and arms race sources always result in a number of deformed babies proportionate to the quantity of released particles. Consider this fact when the next nuclear power station is erected and the next weapon tested.

★ Conserve water. Directly and indirectly each individual uses about 95 gallons per day. Mend faulty taps and toilets: don't run taps unnecessarily. Appliances such as washing machines that use water should only be used with full loads. The London Water Board is so concerned about wastage from faulty taps that they will replace washers free of charge. If your local WB doesn't do the same they should be encouraged to do so.

★ Put a brick in the toilet cistern to reduce the amount of water it uses. Do this in every toilet in your place of work/study and write an "ecograffiti" to say what you've done and why.

★ Bath with a friend.

★ Make sure that all goods are used rather than duplicated and/or hoarded. Start a "Free Exchange" with friends and acquaintances. Better still, open a "Free Store". As people learn to take without having to pay in any way, they will learn to give without expecting payment—and that's revolutionary.

★ Consider the possibility of setting up a commune—one advantage of which is the reduction of unnecessary duplication of material possessions.

★ Plant trees. Defend trees due to be chopped down, by obtaining a Tree Preservation Order from your local council, or, if necessary, by direct action—such as a "sit-down" or "climb-up" that blocks the tree fellers and their equipment. Apart from their natural beauty, trees reduce soil erosion, traffic and other noises, and to a certain extent, help purify the air. Develop the possibility of guerrilla tree planting in your area.

Support campaigns against the digging up of hedgerows; they are an important habitat and refuge for wild plants and animals whose extinction we allow at our peril. Protest to people and institutions who cover the earth with concrete and paving.

★ Pass on this leaflet, magazines and papers for other people to use. Try to limit the amount of paper products you use: due to the chemicals used in their manufacture they cannot be returned to the earth. Remember, a tree has to be cut down in order for us to have even the smallest paper product.

★ Do something to stop junk mail. For example a door-to-door collection in your own street asking for spare junk mail—then post it all back to the senders, without stamps. Always return your own supply with suitable comments.

★ Return excess wrapping materials, especially the supermarket hard-sell variety. Ask the store manager to pass on your complaints, or send the stuff directly to the manufacturer. Ask shop-keepers not to put your wares in paper bags when it's not really necessary.

★ Investigate the possibilities of recycling material. During World War II, 66% of paper was recycled. Some local councils will collect paper refuse separately. If your local council doesn't, pester them until they do. Paper is a good substance to start with but almost all materials can be recycled, even plastics—also aluminium cans, steel cans and glass.

★ Always return non-returnable bottles, either to the shop where you bought them or to the offices of the company that produces them.

★ Agitate for non-polluted conditions in your place of work. Educate your unions on the issues. In most factories even the existing inadequate safeguards are ignored. Polluted working conditions maim people (and sometimes kill) through excesses of chemical and abrasive dusts, noises, noxious fumes, vapours or sprays.

★ Sit very still for a while each day and listen to the noises around you; traffic, planes, TV, radio, fridge, compulsive chatter. Some carpet cleaners are designed to make more noise so they will sound more powerful. See what you can do to cut down on noise in and around your own home.

★ Stratospheric pollution, tremendous increase in exploitation of oil resources, extreme noise levels at airports and sonic booms, are just the start of a host of good reasons for supporting anti-supersonic transport campaigns.

★ Refuse to be a part of the inanities of fashion trades that turn our clothes into throwaways after one year of partial use, and dull our abilities to perceive real beauty. Learn to recognise the ways in which we are deceived by fashion changes and planned obsolescence. Mend clothes, swap clothes, pass them on.

★ Free yourself from "whiter than white" fetishes. We just don't need brilliant, dazzling, snowy etc etc whiteness. Detergents contain two ingredients that are ultimately lethal to our environment—surfactants and phosphates. The surfactant used in America is LAS and quite easily breaks down in water (biodegradable). In Britain, however, the surfactant is ABS (Alkyl benzene sulfonate) which is much more difficult to break down even if you try (which we don't). ALL leading detergents contain this.

A recent royal commission stated that "half the total phosphates in our lowland rivers come from household detergents". These overfeed the algae causing them to multiply and choke off precious oxygen supplies, killing fish and other organisms (eutrophication). Most detergents contain phosphates.

So switch from high-phosphate detergents, especially enzyme varieties ("biological"), to soaps and washing soda. Lux is almost pure soap, Persil and Rinso about 50%. If you've been using detergents the residue will turn yellow when you first use soap—this can be avoided by washing once with hot water and washing soda.

Learn to make your own soap.

★ Don't be conned by packaging that has overlarge holes to pour the product through. Make your own gap. Use less of everything.

★ The most horrific crime against the environment is the direct destruction of mankind itself. Refuse to supply the wherewithal for wars and other murders, and boycott the products of the most repressive regimes—South African goods for example.

★ Try fasting for a day.

★ Household and garden chemicals labelled "keep out of reach of children" are generally not much good for the environment either. Try not to use them at all. Pesticides especially are getting into the food chain, contaminating the food we eat and the milk we drink.

★ Teach yourself, friends and children to distrust advertising, to see through the gross manipulation of our minds that is involved, to understand the dangers and shallowness of consumerism.

Be imaginative in your defacement of advertisements.

★ Get over hang-ups about insects and other animals. Learn the ways in which they are our friends, and respect them. The natural world is beautiful in all its variety and is not there to be crushed or sprayed.

★ Join the fight to save endangered species of animals. They and their environment are being destroyed in many parts of the world so that their skins may adorn unthinking ladies here. London is the world centre of the fur trade and we must make it set a better example.

★ As a nation of animal lovers we feed our pets over one thousand whales each year. Many species of whales are almost extinct. We also kill whales to make our soap a bit softer and for many other trivialities, all of which can be catered for without destroying yet another form of life. "When the last individual of a race of a living thing breathes no more, another heaven and another earth must come to pass before there can be such a one again".

★ Think twice before acquiring pets—remember that the question of resources that applies to the maximum of children we should have applies also to pets.

★ Talk with other people about these concerns. Share them, experiment with and discover, new alternatives together.

The above list was compiled with a good deal of help from *Peace News* readers, especially from Nottingham University Peace Society. Please send comments and new ideas to Greenpeace, Peace News, 5 Caledonian Road, London N1. Thanks.

"Greenpeace" has been revised and reprinted from **Peace News** (July 9, 1971). Paul Wesley was formerly features editor of the paper.
Peace News—a radical weekly newspaper—is committed to nonviolent revolution both in everyday life and in the structures of society, involving both resisting oppression and making alternatives.
Its ecology coverage attempts firstly to analyse how we are endangering the planet, the social forces at the root of this, and to point to the need for non-hierarchical, decentralised social structures; secondly, to publicise particular instances of environmental aggression; thirdly, to suggest and report on strategies of action—at the level of personal change (the "Greenpeace" suggestions, for instance), group action (such as bike-ins or community action against pollution), or making alternatives (food co-ops, community workshops, experiments in harnessing renewable energy resources).

GREENPEACE

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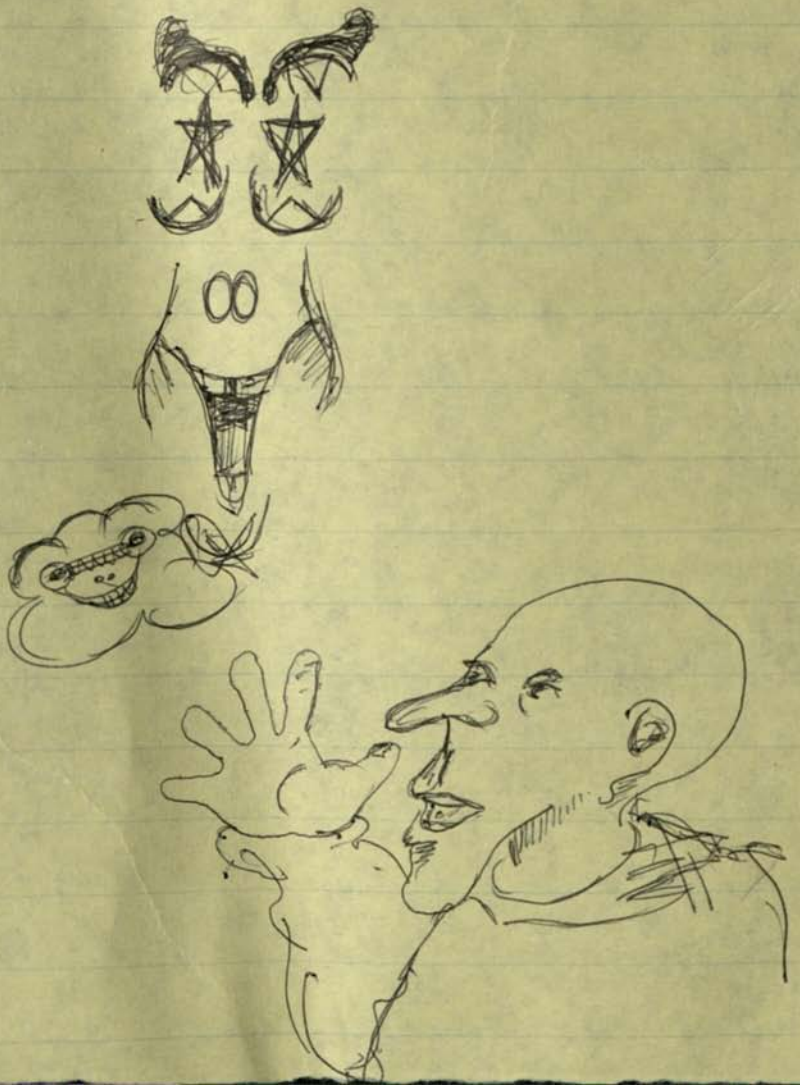


CURE ALL—

"a fabulous herb said to cure all diseases"

GINSENG IS one of the most powerful of the known medicinal roots, and is surrounded by a great web of mystery, superstition, fancy and greed. The Atherva Veda records that "the strength of a horse, mule, ram, goat and even bull, Ginseng bestows on him". Ginseng is, in botanical terminology, Panax. The word panacea means "all-healing" from the Greek. It is also the name of medieval herb, Panace, described in the Oxford English Dictionary as "a fabulous herb, said to cure all diseases".

American herbalists, however, merely say that it is good for stomach upsets. While the Russians grow huge plantations of it in Siberia and give it to their astronauts, and Swiss scientists put it in the only available geriatric preparation, Encyclopaedia Brittanica condemns it as worthless, saying that " the action of the drug appears to be entirely psychic." Many young people in the West regard it as "psychic food", with the inevitable consequence that others classify it as "an alternative to pot and alcohol." (Sunday Times, recently)

Nevertheless the Chinese consume it in large quantities, and give it an almost sacramental treatment. Good roots can be found wrapped in layers of silk within small lead boxes that are believed to keep in the radiations which the Chinese regard as the source of their potency. Many reports from consular officials and travellers (including Marco Polo) are summed-up by what one Hong Kong business man said in 1904: "There are 400,000,000 Chinese and all to some extent use Ginseng. A curious fact is that the Chinese highly prize certain shapes among the roots, especially those resembling the human form. For such they gladly pay fabulous prices, sometimes 600 times its weight in silver".

There are other medicinal and mythical roots, for example the mandrake, which can bear a relation in appearance to humans. Part of their power may indeed be due to the faith placed in their caricature of man. The more man-like the more effect they would have, and the properties of the root would be thought to merge with those of the man who ingests them.

Roots which germinate in the dark and incubate so long hidden from view within Mother Earth can be regarded as a source with respect to plant life, and by extension animal life too. Country folk would respect Ginseng in particular because it seems to "choose" the most inaccessible places to grow, and grows very slowly in its seclusion.

The Ginseng mythology blends with another wholly Chinese preoccupation. That is, in the traditions of Taoism and Chinese alchemy, the search for immortality and the distant islands of the immortals which, once encountered, would ensure transcendence and a life of eternal bliss. Chinese alchemists worked towards the Elixir in much the same way as the Europeans toiled to make the Philosopher's Stone. There is thus in China an old spiritual quest for agents which might prolong life. Ginseng was, and still is, regarded as one of the most important plants for the purpose of increasing life-span.

> "If even the herb Chu-seng can make one live longer, Why not try putting The Elixir in the mouth?" - from a Chinese Alchemical Manuscript A.D. 142.

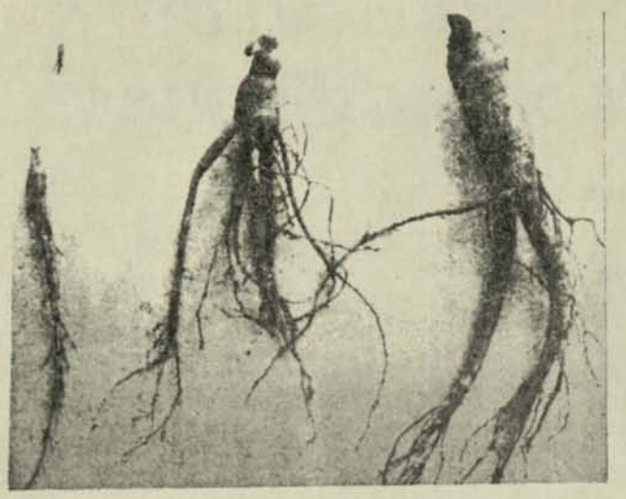
The effect of Ginseng on longevity cannot be considered outside the ancient Chinese hermetic quest for the Elixir, a quest which still lingers on in the people who treat their Ginseng with devotion and ritual, and keep it in lead boxes.

In the past, the Imperial Ginseng, the highest grade gound, was grown in the Royal Parks and jealously watched and guarded. Its use was limited to the higher echelons of Imperial Chinese circles. The Chinese and Tartars fought battles for ownership of Ginseng land, and one Emperor built a fence round an entire province to safeguard his growing plants.

All Ginseng gatherers had to give the Emperor $2\frac{2}{3}$ lbs. Above this, the Emperor would half the equal of its weight in silver - which was, however, far below market price. This high taxation resulted in the vast majority of Chinese settling for poorer quality Ginseng, and it opened the way for imports of inferior root from Japan, Korea and even America. Ginseng export

"Delights in his Ginseng garden"

from China was, however, severely punished.
In the writings of the Emperor Shen-nung, who in 3,000 B.C. recorded much ancient herbal wisdom, Ginseng was regarded as the most powerful of all the herbs available. In China today there are few full-time Doctors, the majority being part-time peasant Doctors who maintain traditional grass-roots medical care. Herbs are used widely and their use is encouraged. Ginseng is obtained by herb gatherers in the forests and also cultivated in the communes. It is taken by nearly all adult Chinese in different ways.
The old people like to soak a whole



One, two and three year old Ginseng roots

plant, and the root, in a bottle of brandy, and then drink the brandy over a long period. A glass of such "conditioned" brandy is a precious drink. Alternatively, pieces of root the size of a hazelnut are chewed every few hours; or, boiling the root in a special little silver Ginseng kettle makes a bitter Ginseng tea. The leaves, too, are the basis for more palatable teas.

No iron was ever allowed to come into contact with the root. Ginseng was taken regularly every year, and it was believed that only through continuous usage could an increased life-span result. Several authors, Western and Eastern, ascribe the health and vitality of the elderly wealthy Chinese to Ginseng alone.

The Chinese now believe that it increases vitality and energy, prolongs life, and is particularly effective in restoring potency lost through age or trauma. There is a story that many of the White Russian soldiers who crowded into Harbin, Manchuria in 1920-23 and had fought in two wars were ill and impotent. The Russian Doctors failed in restoring potency, while the Chinese Doctors were much more successful, chiefly through the use of Ginseng.
The Chinese state that its effect is not on the sexual organs, as an aphrodisiac, but rather on the whole system. It was meant to be used in this respect accompanying a period of continence so that its invigorating effect would be more noticeable.
The Chinese say that continence results in the extra secretions arising from the use of Ginseng becoming reabsorbed into the bloodstream and increasing the vitality of the brain and body. This is analogous to the Tantric belief in conservation of seminal secretions during intercourse.

The Chinese additionally prescribe it for many disorders, especially of the lungs and stomach, and they use it both as a tonic and as a centrally acting sedative. Shen-nung notes that it helps to allay fear and build character.
Gathering of Ginseng has produced a considerable mystery. The Chinese say that Ginseng glows in the dark, and the gatherers must, therefore, wait till nightfall before looking for it, when the hidden plants can be picked out. But as soon as the plant is approached, apparently, the light goes out, so the gatherers customarily shoot arrows at the plant and return the next day to pluck the plants, located by arrows. There have been some attempts to link the glowing Ginseng with its supposed radiation, but the explanation is probably not phosphorescence but rather a multitude of glow worms which collect on the leaves. They would, of course, go out when anyone came near.
Ginseng belongs to the family of Arialacae, and there are several species and even more varieties. The predominant species in America is called Panax quinquefolium as opposed to the Asiatic Panax Ginseng.

American Ginseng is featured in Red Indian herbal lore, where it is used for stomach disorders, menstrual pains and possibly in love potions. Early American family herbals do not regard Ginseng as anything special. They say that it cures gas in the stomach, indigestion and weak appetite.
American Ginseng, however, has become involved in a very strange business. Ginseng in North America was supposedly discovered by a Jesuit missionary, Father Lafiteau, who found a plant in Canada matching those in China and sent it off to France. The French Academy of Sciences confirmed that it was indeed Ginseng, whereupon he sent samples to China in the hope of selling it to the Chinese. Many months afterwards the boat brought back news that they would buy it.
The American trappers began to collect Ginseng in quantity from the forests of Tennessee and other areas, especially near the Allegheny Mountains. It was a novel occupation: 'seng diggers' went into the woods armed with a mattock and sack, and searched for Ginseng in its favourite habitats. When cultivation became possible at the turn of the Century, the volume of Ginseng exported increased, although it was only a small part of the total Chinese consumption. The amazing fact is that it happened at all, bearing in mind the poor quality of the American species.

Compared to the marvellous attributes described by the Chinese, the Americans doubt whether their Ginseng is any use at all. They ascribe the same antidyspeptic properties to a large number of other teas and infusions - Ginseng seems only to have been regarded as special by virtue of its demand in China. W R Harding, the American Ginseng expert, writes that "It is indeed doubtful if the root has much, if any, medicinal value, and the fact that the Chinese prefer roots that resemble, somewhat, the human body only goes to prove that their use of the root is rather from superstition than real value". That such quantities of grossly inferior Ginseng were sold to China, the mother of Ginseng into antiquity, says much for American dedication to business. It is a case of not only selling coals to Newcastle, but selling the worst grade of brown coal.

Ginseng cultivation in Korea and the Far East is a fine art. Seeds are collected only from the best plants, so that the stock is continually

Root resembling a human body

improving. The seed lies dormant for one year, a slender stalk appears in the second year, and after many more years the plant is a sizeable shrub with one main stalk and branching prongs. It is one of the slowest growing plants known. The root is not useable for seven years, which contributes to the rarity of mature plants growing wild. The American cultivators, however, report that the three year roots of their crops are equivalent in size to thirty year roots growing wild. Ginseng needs a rich loose virgin soil with plenty of moisture and yet well drained - "It won't grow with wet feet". The plant must be shaded, and in general conditions must recreate a deep forest environment as closely as possible. Some growers did start gardens in the forest, and these were often poached.
When the root is pulled, it is thoroughly dried until it is brittle and translucent like glass. The colour of the root is dependent on the method and speed of drying.

Japanese pharmacologists have analysed a large number of the chemical components of Ginseng. Its medicinal properties are probably due to glycosides (digitalis the heart-stimulant from the foxglove, is a glycoside), but no one has succeeded in pin-pointing an "active constituent" do date. Professor Brehkman, who heads an Institute of Pharmacology in Vladivostok, describes a series of thorough tests on Ginseng.

He finds that mice, for example, when exercised to exhaustion are able to continue twice as long during subsequent exercise when they have had some Ginseng extract. They also increased the speed of conditioned reflexes and learning ability. In controlled trials, he showed that people could carry out complex repetitive tasks quicker, for longer and with less mistakes after having had Ginseng. These are standard tests to assess the action of stimulants on the body.

He concludes from them that Ginseng is a powerful short-term stimulant, is completely safe and non-habit forming and can act as a sedative too - that is, it does not cause insomnia and may even prevent it. Not only that, but in long term tests, in which Ginseng was taken in repeated doses over a month, subjects showed an equivalent long-term increase in endurance and ability which lasted for a month after the men had stopped taking the drug. Professor Brehkman recommends that it be used to help men on jobs like sentry duty. Whether it is actually given to soldiers for that purpose is not known, but Chinese soldiers do have Ginseng which is intended to be taken if they become wounded. This is to prevent them succumbing through shock before they can get to a hospital. This illustrates what is probably the main effect of Ginseng - its influence on hormones.
These chemical messengers circulate within the body, and co-ordinate responses involving several of its parts.

One response for which hormones are especially important is the reaction to stress, such as a shock or a wound. Ginseng was found to have a profound anti-inflammatory effect, and reduced the susceptibility of rabbits and mice to infections and toxic agents. Ginseng considerably assisted in stress situations, reducing the load on the glands making these hormones- especially the corticosteriods, produced in the adrenal glands. It is interesting in this respect that it was given to Russian astronauts to protect them from infection.

It is clear that stress is one of the great killers in the urbanised society. Hardening of the arteries and heart attacks are the main causes of death in America and Britain. These corticosteroids are known to be somehow involved. Ginseng taken every year serves to reduce the production of these stress hormones. This not only helps survive a short period of intense stress, as in injury, but also a long period of mild tension. Presumably, it would also assist in maintaining a reserve capacity, till later on in life. This may be one explanation of the fabled powers of Ginseng to prolong life: people would be healthier in old age and more resistant to infections and degenerative cardiovascular diseases.
Fertility and the sexual response are also controlled by hormones. The ability of Ginseng to maintain potency in elderly people can also be explained in terms of its action on these hormones.

Evidently the Russian and Chinese scientists have vindicated Ginseng as a root with considerable medicinal value. Explanations of the multitude of effects reported in herbal literature and folklore are now available, and this folk medicine itself can now be seen to have a core of understanding based on observations of the traditional consumption of Ginseng. The Russians work has even added a new property, that of short-term stimulant, which is not mentioned in the writings and reports of travellers and Chinese Doctors.

Ginseng is available everywhere today in China in sophisticated packaging, in the same way that say, aspirin is here obtainable over the counter. If it is of such obvious value, why is there little interest in the West?
There are several possibilities. First of all, Western experience is mainly of the wholly ineffective American root of Panax quinquefolium. This has been the cause of a loss of confidence in Ginseng from the very beginning.

Secondly, most of the available sources of information are from the East. There is, unfortunately, a great credibility gap in Western understanding of Chinese science, particularly medicine.

Another reason is that an active component of Ginseng has still not been purified. Its agency stays subtle and elusive and there is no one effect which might be used to assay or measure it physiologically (except possibly as a stimulant). Since the raison d'etre of the pharmaceutical industry is the isolation, testing and dispensing of extracted or synthesised medicaments, Ginseng has not aroused any commercial interest. Such an industry would be superfluous to the marketing of roots. It also cannot be said to be a medicine as such - it doesn't cure any specific disease, and presumably there has not until now been much interest in exotic plants which have only tonic and prophylactic properties.
The situation is changing, however. There is more information, and again at the grass roots level of herbalism and homeopathy an increasing interest in Ginseng in the West.

Garden-grown Ginseng plant

CURE ALL ?

WHY CANCER RESEARCH?

CANCER RESEARCH goes from strength to strength. The overall expenditure, especially of the Western nations, is already running into several hundreds of millions of pounds. Every year it continues to rise. And, in spite of the existence of gigantic research organisations like the Imperial Cancer Research Fund, new bodies dedicated to its understanding and treatment continue to appear.

On the face of it, this outpouring of money needs little explanation; it seems so obviously a worthwhile aim to cure cancer that the question "Why?" is seldom asked. Should one have the impertinence to ask it, the question can take two forms.

Firstly, why is cancer of all the killing diseases in our society so particularly feared? Why its central and dominating role when it comes to commanding money for research? Deaths due to arteriosclerotic and degenerative heart disease exceed those due to cancer by almost half as many again, yet cancer is still the bogey.

Several explanations seem possible. Academically the problem of cancer is a fascinating one and closely bound with fundamental work on cellular and molecular biology. To be associated with research into the aetiology of the disease is to be connected with one of the most exciting aspects of contemporary life-science. Research into the causation and cure of cancer is thus widely justified on grounds of pure knowledge as well as medical expediency.

From the patient's point of view, cancer is certainly not the most pleasant of fatal diseases; compared with some it is long drawn out, painful and may be aesthetically revolting. If a pathological heart condition can be compared with walking through a valley waiting to be shot by an eccentric but accurate sniper, then death by cancer is slow suffocation. Knowledge of a bad heart means that the end is anticipated but that when death comes it will be relatively quick and with little or no warning. Death on detection of advanced cancer is again expected, but in this case the sufferer is also made aware of the process of dying.

Suppose we accept that concentration of resources on cancer as opposed to other forms of fatal disease may be seen as reasonable both on academic and humanitarian grounds. This leaves us with the second and broader "Why?" Even accepting that cancer is an unpleasant way to die, why does society concentrate so much of its medical research on this and other diseases which kill rather than those which merely debilitate? Why the obsession - despite the claims of the medical profession - with quantity (length) rather than quality of life?

Estimates suggest that the total cure of all cancers in the USA would add only 1.5 years to the expectation of life of the average 65 year old American. Diseases like arthritis, on the other hand, progressively reduce the quality of life and make many people - especially the over-65s - a burden to themselves and to their fellows for a period vastly in excess of a mere year and a half. Logic would dictate a considerable reapportionment of resources towards crippling rather than killing disease.

It is, of course, true that human values are seldom determined by logic, but it can still be instructive to speculate on the reasons for such an illogical state of affairs.

One obvious rationale for the study of 'killers' rather than "cripplers' is a straightforward instinct for survival - even a debilitated existence is better than none. And once again there is the academico-intellectual factor; one of the classical means of studying the normal workings of a system is to disturb it and see how it reacts. Disease provides a ready-made disturbance and it so happens that the fatal varieties (especially cancer) have been reckoned as potentially the most lucrative when it comes to revealing fundamental processes. As previously commented, a vast amount of what is now known about the nature of the cell and its relationship to the whole organism has come from work described under the blanket heading of cancer research.

Perhaps such simplistic explanations are the whole story. But can they really account for the obsession of society with trying to prevent the inevitable death of its individuals?

We live with an economy which depends on consumption. From the cradle to the grave, consume, consume, consume. Even growth in numbers and growth in affluence are insufficient to satisfy the greater consumption that the economy continually and increasingly demands. Hence the 20th century concept of planned obsolescence, the use-it-once-and-throw-it-away-society whose wastefulness is so appalling. Society has become obsessed with growth and growth means consumption.

Now the one certain thing about a corpse is that it cannot consume; with a final boost to the undertaking trade, the dead cease to be valuable members of the community. Death is the antithesis of the consumer society. In fact, by dying, a person is actually undermining it!

Man often applies a simple solution to things which he believes will undermine his society - he pretends they do not exist. The Victorians felt that way about sex but they hadn't yet invented the production line; when it was found that sex is a valuable asset is distributing the products of the consumer society, much of the previous public reticence was swept away. Death then became the new obscenity.

Victorian man suppressed sex but (to his continual shame) was never able to eliminate it. Today man intends to do better; his own particular obscenity will be destroyed once and for all so allowing him to forget the dreadful disruption which continually threatens his stability!

Of course there are certain paradoxes; one of the central pillars of our economy is the dissipation of large sums of money into searching after the most efficient means of mass death on an international scale. Still, even here one notes, the tacit assumption is that the weapons will never actually be used to destroy the systems which created them.

It has always seemed that there is something quasi-religious in the way that people (personalities in the entertainment world in particular) have been reticent in admitting that they have contracted fatal diseases, especially cancer. Perhaps it is just that they want to be spared the publicity of their private anguish ... or could there be somewhere deep inside, almost subconscious, a feeling that they are letting the side down?

Geoff Watts

ALTERNATIVE PRESS GUIDE

DURING THE LAST few years there has been an enormous increase in alternative publications dealing with every conceivable subject. Unless you happen to live in London, near a good bookshop or have wide contacts with relevant groups it's not easy to find out what there is on any particular subject. This list is intended to help you. It aims to cover all British publications of more than very local interest, in the relevant subjects. There are many european and american publications which are available here but the list would be too long if they were included. British publications often refer to sister publications overseas. The definitions of Community, Science and Society are loosely applied - literary mags, arts and straight politics are excluded, as is the (growing) underground of the right, but anything else that looks interesting and helpful is included. The alternative/straight line is loosely drawn too - on the whole anything that can be found in newsagents (like W. H. Smiths) or is produced for profit is excluded.

For each magazine I have attempted to give a title, price and annual subscription, frequency of publication, address, and a brief description of contents. These descriptions represent only my own views. Where some objective is stated this is often quoted directly. Addresses, prices and magazines change fairly often so the information cannot be guaranteed. I have tried to get a recent copy of everything to check details but this has not always been possible. At the end I have given a list of local contacts/bookshops/mags which should help you find the nearest shop that sells things in the subjects that interest you. The list is organised by subjects but subjects are pretty meaningless - that's part of the point of being alternative - though it seems to make more sense than doing it alphabetically. Subjects are overlapping but journals have not been cross referenced so try all possible sections.

If you can't find something about what you are into why not start your own magazine? A few pounds and a little work is all that is required. Duplicating (loan of typewriter and duplicator, paper, stencil and stapler) is cheapest but offset printing is not expensive and can produce really good looking things. Basic details in (Not So) Alternative London (35p in Straight Shops), from your local community paper or from Alternative Press Information Service, 187 Purves Road, London NW10. Distribution and money are always a problem and you will need a together person to cope with that. The only other difficulty is the police. Depending on what you print they may try and get you for obscene publication or incitement to something. Drug warrants are used by the Special Branch to gain access and they tend to be interested in addresses and subscription lists so, if you are into this kind of thing, it may save trouble for you and friends if you publish from an address where you don't keep the list. On raids, police seem to have a knack of accidently breaking printing presses. They are losing interest in the old time underground and are concentrating on anarchist/situationalist journals. But they are not too discriminating and the D.P.P. who along with the Special Branch must have read more of the alternative press than most people, is currently looking at OZ, FAPTO, MOLE EXPRESS, CATONSVILLE ROADRUNNER and DAILY LIFE following a bust in Leeds. Problems with the police may also arise in street selling and if you escape all this they may open your mail. This was demonstrated recently when the GPO mistakenly delivered to FREEDOM a cover that should have been used for forwarding their mail to the "Investigation Division (Special Section), Post Office, St Martins-Le-Grand". But if you stick to by lines or ecofreakery all should be well.

There is a library-type catalogue of alternative publications (including poetry and literary mags) produced by Smoothie Publications, 67 Vene Road, Brighton. DIRECTORY OF ALTERNATIVE MEDIA PUBLICATIONS 2nd ed. £1 + Supplement No. 1 July 1972 (5p).
If people like this list we will do it again. Please tell us if we have got details wrong and about what we have missed. If at all possible please send us a copy of whatever you produce and we will include it next time. Please write to Martin Richards, 5 Salisbury Villas, Station Road, Cambridge, or c/o Undercurrents.

SOCIETY

STREET RESEARCH BULLETIN
12p occasional
32 Birchdale Street, Moss Side, Manchester. From a Student Christian Movement group. Helping people to research where the power lies in our society. First issue on companies, housing, community action and Irish resources. Companies article especially recommended. Fruits of such labours to be seen in the C.I.S. anti-reports.

COUNTER INFORMATION SERVICES
25p + 10p 4 for £1.20
32 Shaftesbury Avenue, W1. Reports countering the prevailing tone of "information" in the large corporations that run our lives, and the system of which they are a part. Two so far: Counter reports on Rio Tinto-Zinc and the General Electric Co. - glossy like their targets. Very well done.

PLANET
30p
Lhangeitho, Tregaron, Caredigion, Cards. Something of the same spirit in the Principality, plus events, politics and people. Mainly in english. Recently (No.12) law and order in Wales with a good tourists guide to Welsh Courts.

CWMRI OWASG RUDD CAEDYDD
20p £1 for 4
127 Ffordd y Claude, Y Rhath, Caerdydd (Cardiff). An independent news service for Wales. Report No.3 on tai haf/holiday homes. Useful.

SUBURBAN PRESS
8p
9 Sidney Road, S.E.23. "Destroy the suburban dream. Turn the street where you live into a village." Good on housing.

COMMUNITY ACTION
15 p 90p for 6
9 Pattison Road, N.W.2 Inner city housing and community. To help community action groups exchange news, ideas and experience as well as offering an analysis of the 'machinations of government'. Well researched. Lists of local groups. Some of these produce mags. Here are two:
WEST MIDLANDS GRASSROOTS
15p. 165 Heathfield Road, B'ham 19.
CENTRE SPAN
John Dunford, Mundella School, Collygate Road, The Meadows, Nottingham.

SQUAT!
Free. Newsletter of the Family Squatting Movement. The Albany, 1 Creek Road, S.E.8. News of London squatting.

ROMANO DROM
About 8p. Jeremy Sandford, 66a Deodan Road, SW15. Gipsy life and news.

MINORITY RIGHTS GROUP
Benjamin Franklin House, 36 Craven St, WC2. Pamphlets dealing with various groups. Carefully written. No.11 The Biharis in Bangladesh by Ben Whitaker. 45p.

INSIDE STORY
25p 6 for £1.50. Life(?) £10
3 Belmont Rd, London SW4. Media men's stories the straight papers won't take. Edited by Wynford Hicks, ex-Ink.

FACTFOLDER
35p 6 for £2.10 bimonthly.
Factfolder, 13 Clarendon Rd, Gravesend, Kent, or Big Flame, 78 Clarendon Rd, Wallesey, Cheshire. Organisation and development of the class struggle in industry in UK (mostly). No.1 includes the Coventry tool-room dispute, a company profile of Plessey, ship-building in the UK, French steel closures and strikes around the world in 1971. Very good value.

SOLIDARITY PAMPHLETS
27 Sandringham Rd, NW11. Various prices and topics. No.33. The irrational in politics (15p) - The family, sexual repression and Reich. Always well done and informative.

DIRECTORY OF ALTERNATIVE WORK
20p 3rd ed Apr. 1972
Also ALTERNATIVE WORK NEWSHEET. Irregular. Free but postage required, 30p should cover one year. Uncarners, 298b Pershore Rd, Birmingham 5. Do something full-time, that you want to do, that you enjoy and see some purpose in. Most aimed towards some kind of social change. Good list of info/help services.

TEACHING AND LEARNING

RANK AND FILE
10p. 28 Manor Rd, London N16. Leftwing teachers in the NUT 30 local groups. Victimisation, conditions, pay etc. and knocking The Libertarian Teacher.

LIBERTARIAN TEACHER
10p +3p 5 for 50p 10 for 80p
3x p.a. Black Flag Bookshop, 1 Wilne Street, Leicester. Working for educational change both within and outside state schools. Good original articles.

BLACKBORED
7p every few months. 125 Vansittart Rd, Windsor, Berks. For student teachers. Gives alternatives to methods and theories taught. Publicises repressive conditions in teacher training colleges.

FURTHER LEFT
80p p.a. bimonthly. 29 Driftfield Gardens, Tonbridge, Kent. For teachers in further and higher education. "Unity and practical cooperation - for the whole left". Not so alternative but perhaps too early to judge.

TEACHERS AGAINST RACISM
5p £1 p.a. 9 Huddleston Rd, N7

CONTACT
87a Borough High St, S.E.1. Journal of the Pre-School Playgroup Association.

PRIORITY NEWS
40p p.a. 3 x p.a. c/o Richard Blake, ACE, 32 Trumpington St, Cambridge. Not too alternative but aims to continue the development of the ideas that emerged from the EPA projects.

REBEL
3p bimonthly. 211 Ladbroke Grove, W10. I.S. for skoolkids. "We fight within S.A.U. for a broad based union, not a Marxist-Leninist sect recruiting in schools."

CHILDREN'S RIGHTS/KIDS
15p £2 p.a. monthly Schoolkids price 7p or 6p for 5+ P.O. Box 70, 5 Stewart's Grove, London SW3. Started in a rather staid way with the old guard on an editorial board but then came the bust book issue and the board went. From Sept to be called Kids, 'expanding scope to reach a larger audience, make it more relaxed and readable'. About childbirth and mothers too but doesn't quite have the spirit of MOTHER EARTH NEWS here. A lot of contacts with local groups and mags by or for skool kids. Lots of these but try

VANGUARD
3p Schools Action Union, 75a Acre Lane, London SW2. Marxist-Leninist based.

PROFESSIONS

RADICAL PHILOSOPHY
35p £1 3 issues. R.I. Norman, Darwin College, The University, Canterbury. Kent. Not very alternative but academic philosophy has had it coming a long time. Mostly concerned with these foreigners that Oxford has long avoided. Also things about the profession.

NEEDLE
3p 50p p.a. every 6 weeks.
27 Pearman St, SE1. Aims at democratic control of NHS, nationalisation of drug industry, abolition of private practice, etc.

RED ALERT
155 Metchley Lane, B'ham 17. About medical services for medical staff and hospital workers.

SOCIALISM AND HEALTH
Monthly. Socialist Medical Assn, 14/16 Bristol St, Birmingham 5.

GERM'S EYE VIEW
11a Rowan Ave, Manchester. Medicine up north.
10 Roderick Rd, NW3. and down south. 8p

CASE CON
10p 50p for 4 issues. Basement flat, 110 Landown Way, SW8. The magazine for radical social workers. Some see the hand of I.S. here but the graphics are always good and it gives lots of contact addresses.

THE ASS
5p Irregular. 40 Colville Terrace, W11. Not much has been heard from them recently. But radical lawyers could also try J. Smith, 2 Stirling Rd, London SW9.

ARSE (Architectural Radicals, Students and Educators)
15p Quarterly (the only quarterly to appear once a year!) 20 Chalcot Rd, NW1. Thought dead but just reappeared with a solid issue on architectural education, or its lack - 'a major project must be to analyse and do propaganda on the position of the architect in capitalist society.'

REAL TIME
10p Irreg. 36 St. Georges Avenue, London N7. Radical computer workers. Very well produced.

OPEN SECRET
Occasional. Free Communications Group, 30 Craven St, WC2 Broadcasting and Fleet St. Movement for worker and people control.

There are also those alternative house mags in the BBC like the BRITISH EMPIRE. They are strictly for addicts or those who get their bread there.

PAK-O-LIES
"as needed". Liverpool Free Communications Group, c/o 24 Wapping, Liverpool 1. Specialises in truth behind local paper articles.

PRISONS

from outside:
PROP
15p £1.75 p.a. monthly
96 Victoria Ave, Hull. Dick Pooley's union for prisoners. Open discussion of crime, legal institutions and penal systems.

R.A.P. Radical Alternatives to Prison.
Pamphlet, Alternatives to Holloway, 35p. 104 Newgate St, EC1. Constructive, excellent ideas.

from inside:
Most prisons produce 'official' journals (the views of inmates with the authorities' permission. They range from school mags onwards.

THE NEW COURIER
H.M. Prison Grenden Underwood is a leader but the following are also recommended:
ASH WELL PLAYBOY, FORD SCENE, THIS MONTH (Bristol), and INSIDE OUT (Verne). Parkhurst's OUTLET is not surprisingly dead. These are available at the discretion of the Governor.
BARBED WIRE BULLETIN
10p 30 Gardiner Place, Dublin from Long Kesh.

COMMUNES

COMMUNES
20p £1 p.a. bimonthly 3 Russell Way, Wootten, Beds. Journal of the Commune Movement. "Tribal with a haunting heathen air" says the Waxing Moon. "We want you to join the Movement. It's cold out there in the great grey monoculture". Letters, news, descriptions of communes. Lists of international commune journals and Amerindian mags.

COMMUNE BULLETIN
£1 p.a. Quarterly. Willem Tellstraat 8, 9000 Gent, Belgium. International Commune mag in english. Survey and discussion.

MAKING COMMUNES
One off. by Clem Gorman.
Most of what you want to know.
75p. Whole Earth Tools, Mill Cottage, Bottisham, Cambridge.

COUNTER CULTURE

£1 p.a., 4 issues
Mimram Press, Osborn House, Howardsgate, Welwyn Garden City, Herts. "An exploration of the Alternative Society for use in schools, Universities on wherever life style are the subject of debate". Quotes with notes for further reading. Staid.

WOMEN

SHREW
7½p. Women's Liberation Workshop, The Basement, 22 Great Windmill Street, W.1.

SOCIALIST WOMEN
8p. 5Op. p.a. 182 Pentonville Road, N.1. Militant Trotskyites.

SPARE RIB
17½p £2 p.a. Monthly. Spare Rib Ltd., 9 Newborough Street, W.1. A monthly news magazine for women. Thought sexist by some.

WOMEN'S VOICE
5p 5Op. for 6. 9O Mountview Road, London N.4. I.S. for women.

WOMEN'S STRUGGLE
12½p. 75p. p.a. 32 Newell Road, Hemel Hempstead, Herts. Journal of the Women's National Co-ordinating Committee. Theoretical. Several local women's lib. groups produce mags.

PENT UP
93 Westridge Road, Portswood, Southampton. Local and general articles.

ENOUGH
15p. + post
36 Berkeley Road, Bristol. Well written and produced. Poems, housing, women.

THE GAY WORLD

SAPPHO
25p. Monthly.
BCM/Petnel, London, W.C.1. Homosexual women.

COME TOGETHER
5p. Gay Liberation Front, 5 Caledonian Road, London, N.1. Issue particularly good.

LUNCH
25p. £2.80 p.a. Monthly. Campaign for Homosexual Equality (in London), 23 Avon Court, Keswick Road, S.W. 13 (No callers please) Reason not militancy. Events, news, views and contacts for CHE and GLF groups inside and outside London.

GAY NEWS
1Op. £1.20 for 10. Fortnightly. 19 London Street, W.2. National homosexual newspaper. Spans CHE and GLF. Well produced. Small ads.

SCIENCE

UNDERCURRENTS
25p. £1.20 p.a. Quarterly.
34 Cholmley Gardens, Aldred Road, N.W.6. Sheets in a plastic/cellophane bag. Alternative science and technology. No. 2 (Summer 72) on Energy, Methane Power/Water/Wind. Achieved fame with Towards a people's bomb - a recipe for a do it yourself nuclear deterrent.

SEEK TRUTH
10p. 75p 6 issues.
Necessity for Change Institute of Ideological Studies (English Branch), c/o. 569 Old Kent Road, S.E.1. Also produces London Committee Newsheet (free?) Communist Party of England (Marxist-Leninist) "Seek truth from facts to serve the people" "Students and intellectuals, take the road of integrity with the broad masses of working and oppressed people". Bourgeois theories of doom. Eysenck, Hitler's 'race science' in a new guise. Fascist anthropology. And more.

SCIENCE BULLETIN
Donation
c/o. 16 King Street, London, W.C.2. A communist (CP) journal of Marxism and science. "A means of stimulating, reflecting and co-ordinating discussion and activity on issues of science, marxism and society".

BSSRS NEWSHEET/SCIENCE FOR PEOPLE
10p. British Society for Social Responsibility in Science. 9 Poland Street, London, W.1. Mostly the housekeeping of the society but soon to become a real journal (bimonthly) with a new title. Mostly university based. Federation of local groups. Several of these have their own journals.

PENNY DREADFUL
1p. Leeds University Union SSRS, Leeds University. A few duplicated sheets, ought to grow.

SCIENCE CARES (formerly Prototype)
3p. Liverpool SSRS. 2 Vicarage Close, Hale, Liverpool. More substantial.

CONTEXT
Edinburgh SSRS. J. M. Garland, Dept. of Moleculan Biology, Kings Building, Mayfield Road, Edinburgh. Solid but irregular.

CONCERN
Bristol SSRS. Dr. J. Wormald, School of Chemistry, Cantocks Close, Bristol

SCIENCE OR SOCIETY?
10p. 50p for 6 6 a year
5 Salisbury Villas, Station Road, Cambridge. Collectively written, university based. Some local articles but also aiming outside. Strong on psychology/medicine.

RED RAT
15p. 42 Essendine Mansions, Essendine Road, London, W.9. The journal of abnormal psychologists. Has improved. No. 4. Sex. No. 5 on Madness.

BEYOND ETHICS
36 St. Georges House, Gunthorpe Street, London, E.1. Yet to appear. Growing out of a British Psychological Society meeting where the establishment turned off the radicals. Self-managed.

SOCIALIST REPRODUCTION
57D Jamestown Road, London, N.W.1. Translations of Wilhelm Reich.
1. What is Class Consciousness? 30p.
2. The Sexual Struggles of Youth. 40p.
3. Dialectical Materialism and Psychoanalysis. 25p.

RADICAL-TRADITIONALIST PAPERS
No. 1 A Defence of Sacred Measures - 10p. 1 Jesus Terrace, New Square, Cambridge. The "units of British metrology, and of the Eternal and human values inherent therein against the promotion of false and atheistic values through the proposed imposition of the idolatrous metric system". By John Michell.

ENVIRONMENT/ECOLOGY

SURVIVAL SCRAPBOOK
£1.25. Unicorn Bookshop, 30 Gloucester Road, Brighton. Britain's answer to the Whole Earth Catalog, but ideas not commerce. No. 1 on Shelter, widely used by architect students and No. 2 on Food. Now out.

RESURGENCE
25p. £1.80 p.a.
275 Kings Road, Kingston, Surrey. Journal of the 4th World. Natural and social ecology, strongly decentralist. Solid and thoughtful.

THE ECOLOGIST
25p. £4 p.a. Monthly.
73 Kew Green, Richmond, Surrey. Never quite regained the heights of the 'Blueprint for Survival'. News from the Friends of the Earth.

POLLUTION SOLUTION
10p. 178 Wymering Mansions, W.9. No. 1 came in a polluting plastic bag. Slow change within the system by education.

BRE
15p. £2 p.a.
Education Unit, Town & Country Planning Society, 17 Carlton House Terrace, London, S.W.1. This does the same thing much more thoroughly. Teachers would find this useful.

CONSERNUS
Free
NUS. Conservation Project, 3 Endsleigh Street, London, W.C.1. Info, local groups, contacts. To service and set up student environment action groups.

SEED
Free copy from Geoff Hunt, Dept. of Philosophy, Edinburgh University, George Square, Edinburgh, Scotland. Scottish education for environment and development. "Environmental problems are a facet of over-development and underdevelopment which in turn are related to such questions as militarism, racism, economic exploitation and power politics".

YOUR ENVIRONMENT
50p. £2 p.a. 10 Roderick Road, London, N.W.3. Going some time but undeservedly unknown. Monitoring programmes a speciality. News.

ALL CHANGE
6p. I.C.A. Carlton House Terrace, London, S.W.1. I.C.A.'s transport action link. A clearing house for the exchange of transport information.

MORE RADICAL ARE

BLUP
50p? (that's what we paid for No.2)
113 Warwick Avenue, London, W.9. Biotechnic land use for pleasure. No. 2 will tell you how (in detail) to convert your car to propane/butane/methane.

STREET FARMER
30p. 63 Patshull Road, N.W.5. Ploughing the streets is as constructive an answer as any. Mainly visual. No. 2 is sadly hard to see - try another printer?

RESOURCES STUDY GROUP
30p. + post.
27 Harcourt Street, Dublin 2. No. 1 Irish Mining - The Need for Action. No. 2 Navan and Irish Mining. Documentation of an £850 million robbery. Irish Third World Group and Republican Movement. Very detailed and well researched. "Chile took it back - so will Ireland".

NOW YOU'RE OUT ON THE ECOFREAK FRINGE

FLOWER PATCH
10p. or 60p p.a.
127 Tower Road South, Warmley, Bristol. Gentle living, humour, insights into spiritual reality and the natural World. In honour of Flora Klickmann of Flower Patch, Wye Valley; pioneer ecologist.

THE COUNTRY BIZARRE
15p. 70p p.a. Quarterly.
19 Damesmoor, Ruscote, Banbury, in the Merry County of Oxford. Love and smiles from Andy, Ben and friends. Surely the best produced of all alternative mags. Victorian engravings, country life, recipes, hunt saboteurs and life.

ARCHAELOGY

Academic archaeology seems unmoved as yet but there is a healthy crop of journals dealing with the 'live tradition.

THE LEY HUNTER
10p. £1.20 p.a. Monthly.
5 Egton Drive, Seaton Carew, Hartlepool. Co. Durham
Ancient wisdom, skills, ley lines and megaliths.

LOCAL INTERESTS ARE REPRESENTED BY

TORC
Glastonbury's own .10p from Avalon House, the Batch, Ashcott, Bridgwater, Somerset.

ARCANA
30p 1 Portland Place, Cambridge. More substantial (and serious) from that other great centre of occult lore near Wandlebury and on the edge of the Nuthampstead Zodiac. Takes a hard line on the Glastonbury freakers.

ALBION
10p. £1 p.a. Monthly.
10 Northridge Road, Manchester, 9. This throws its net wider and has a literary bent. Well written and produced.

CELTIC NEWS
50 p.a. Quarterly.
Padraig Conchuir, 84 Pulleyns Avenue, East Ham, E.6. Despite the address takes a bread view and brings news of nationalist movements in Alba, Briezh, Cymru, Eire, Kernow and Mannin.

SOMEWHERE NEAR HERE GOES

THE WAXING MOON
20p. 70p p.a. Quarterly (at Samhuinn, Imbok, Bealteinne and Lughnasad).
103 Maindy Road, Caerdydd, Wales. The official organ of the Pagan Movement which will bring you "the love of the Old Ones and the Wild Ones, in the power of the Sun and the Moon's fecundity, and in love of the Earth Mother and all her heathen children". Also publishes good list of Amerindian publications.

QUEST
20p. 75p p.a. Quarterly.
Spook Enterprises, 38 Woodfield Avenue, London, W.5. Magic, ritual. British mystery tradition. Good on rites.

THE WICCAN
8p. BM/MCEM, Monomark House, London, W.C.1. The Pagan Front.

FURTHER INTO SPIRITUALISM AND TAROT ARE

INSIGHT
22½p. 90p. p.a. Quarterly.
118 Windham Road, Springbourne, Bournemouth, Hants.

MANTRA
15p. P.O. Box 725, London, W.5. Much the same tradition (at least to an outsider) with addresses of spiritual group.

NEAR HERE WE SHOULD INCLUDE

FLYING SAUCER REVIEW
30p. 21 Cecil Court, Charing Cross Road, London, W.C.2. News of sitings.

BOTANY

SPEAKING OF HERBS
40p for 6.
K.W. Eames, West House Cottage, Barrach Lane, Aldwych, Bognor Regis. Herbs and natural forces.

SEED
10p. 88 Boileau Road, W.5.
Organic eating and growing.

HEADS AND THE OVERGROUND UNDERGROUND

All is not well here and the great days seem past.

OZ
25p. £3 Monthly.
Oz publications Ink Ltd. 19 Great Newport Street, London, W.C.2.

I.T.
15p. 11b Wardour Mews, W.1.
These two have suffered most. Oz is all glossy, full of ads for records and nudie posters, while I.T. is mostly reprints from the U.P.S. Ink is sadly dead but Oz will sell you a bound set for £100. The last issue, Ink in Love - exploding the romantic myth, is especially worth looking for.

FRENDZ
15p. £3.50 p.a. 26x p.a.
307 Portobello Road, W.11.
Much more life here and the old radical/liberation tradition continues.

FAPTO
15p. 10 £1.50 20 £2.50
Northdown Road, Margate, Kent. Well worth it if only for the life line section (help/action/organisation/bookshop addresses for the whole country). More too.

SPIKE
£1 for 12 issues.
15 Hope Street, Glasgow, 2. Scotland's first national underground paper; already being read by the police but hard to find in the South.

PEACE NEWS
7p. £4.94 p.a. Weekly (7 weeks for 50p. trial offer). 5 Caledonian Road, London, N.1. CND may have gone but this part of Jeff Nuttall's bomb culture lives on. News, political and social comment for non-violent revolution.

TIME OUT
10p. Newsagents.
Time Out Ltd. 374 Grays Inn Road, London, W.C.1. What to do in London + Agit Prop section free to groups. Publications, meetings, help, claimants, Left bookshops and demos.

POLITICS

Classification very difficult here and divisions are very fine. Our arrangement should not be taken too seriously. This section does not pretent to be complete and has a libertarian bias.

OMPHALOS
20p. c/o. 6 Cambridge Gardens, London. Ramifications of situationalist theory. When consciousness decays, ideology oozes out. Friends of King Mob.

LIBERTARIA PAMPHLETS
15p. £1 p.a.
95 West Green Road, London, N.15. To create at long last a situation which goes beyond the point of no return. The totality for kids. The commune, Unitary urbanism and the decline and fall of the 'spectacular' commodity-economy.

DAILY LIFE
6p. Society for the Liberation of Daily Life. 68 Harold Terrace, Leeds, 6. To study everyday life with the purpose of changing it. Why else? Clear and well written.

GALLOPING MAGGOT
10p. From the East of England. Situationalist. Mostly graphics.

FREEDOM
5p. or £2.60 p.a. Weekly.
84b Whitechapel High Street, London, E.1. The newspaper of the Anarchists Federation of Britain. General political news and group views.

ANARCHY
10p. Monthly.
84b Whitechapel High Street, London, E.1. Their theoretical journal.

ANARCHY
20p or 50c
95 West Green Road, N.15
Midatlantic with material from Friends of Malatesta.

BLACK FLAG
6p 12 75p almost every month.
10 Gilbert Place, London, W.C.1. Bulletin of the Anarchist Black Cross. Political prisoners and other international news. Editor, Stuart Christie, on trial with the Stoke Newington 8.

BLACK AND RED OUTLOOK
5p. 116 Gilda Brook Road, Eccles, Lancs. Paper of the anarchist-syndicalist alliance.

HYDE PARK SOCIALIST
3p. Quarterly.
J. Hughes, 48 Gilbey Road, London, S.W.17. Libertarian and radical around speakers corner.

WREKIN ANARCHIST VOICE
5p. Wrekin Libertarians, 13 Albert Road, Wellington, Salop. A local paper.

CONFRONTATION
7½p. 75p. for 12 (free if you are poor). Confrontation Press, 63a Brick Lane, London, E.1. Libertarian. Well produced and written. Interesting material on Russia.

SOLIDARITY
5p. 27 Sandringham Road, N.W.11. Revolutionary libertarian socialists. Self-management and workers councils, also squatting and tenants groups.

BIG FLAME BULLETIN
7½p. Bi-monthly.
78 Clarendon Road, Wallasey, Cheshire. Merseyside syndicalists. Fisher-Bendix, sit-in at Fords, etc.

BIG FLAME
4p. Merseysides socialist newspaper.

RED NOTES
248 Bethnal Green Road, E.2. from the Agit Prop. Collective.

SOCIALIST WORKER
4p. £1.70 for 6 months. Weekly.
6 Cottons Garden, E.2.

OPPOSITIONIST
8 Portland Court, St. Peter's Way, London, N.1. Towards a revolutionary workers organisation. 'we wish to avoid both the 'centralism' of the Bolsheviks and the de-centralisation' of the libertarians.

THE COMMUNIST
10p Monthly £150 p.a.
138 Lordship Road, London, N.16. The theoretical journal of the British and Irish Communist Organisation. "Without a revolutionary theory there can be no revolutionary movement (Lenin)".

CATONSVILLE ROADRUNNER
8p. £1.25 for 12
28 Brundetts Road, Manchester, 21. Revolutionary christian. Food coops, other religious groups, political action, squatting, free schools and education.

IRISH LIBERATION PRESS
10p £1 p.a. Monthly.
83a Golders Green Road, N.W.11. For a people's socialist republic of Ireland.
(P.S. there are many other Irish things that could be included).

BLACK PANTHER MOVEMENT COMMUNITY NEWS SERVICE
5p.

FREEDOM NEWS
4p Fortnightly. Local and international news. 38 Shakespeare Road, S.E.24. 154 Barnsbury Road, London, N.11.

THE BLACK LIBERATOR
20p. £2 p.a.
14 Camden Row, London, S.E.3. Theoretical and discussion journal for black revolution.

GRASS ROOTS
5p. £1 for 15 Monthly.
54 Wightman Road, London, N.4. Black Community newspaper from the Black Liberation Front. Home and international news. Future uncertain; distribution manager busted for incitement to various things.

RED MOLE
7½p. Fortnightly.
International Marxist Group, 182 Pentonville Road, London, N.11.

WHITE PANTHER PARTY
A revolutionary organisation dedicated to building a new man, a new woman and a new World. Journals from various local chapters, seen to be replaced by a combined national one called Chapter.

CHAPTER
10p. + 3p.
Box 5, 1 Conference Road, Abbey Wood, S.E.2. Abbey Wood chapter.

THE CHARTIST
4p. C. Knight, 14a Olive Road, Cricklewood, London, N.W.2. Young chartists.

CLASS WAR
5p. 34 Tabley Road, Holloway. London, N.7. London Alliance in Defence of Workers' Rights.

COMMUNITY AND LOCAL

The aim of this section is to give addresses of local magazines, bookshops or help/info services in as many towns as possible. Many Info. places publish local community mags. usually with the same name. Not all of these are mentioned separately. A full list of local contacts is published in Fapte or information can be obtained from BIT 141 Westbourne Park Road, W.11. (01-229-8219).

ABERDEEN
Aberdeen Arts and Community Workshop, 3 Holland Street. 56923.

BARNSLEY
Bagins, 12 Regent Street South, Headshop + info.

BARNSTAPLE
North Devon Snail. 10p + post.
£1 p.a. Monthly. Peter Blake, The Flats, Corffe, Tavistock, Nr. Barnstaple.

BATH
Genesis 10p.
Bath Arts Workshop, The Organ Factory, Cleveland Cottages, London Road, Bath. 0225-5169. Output, la The Paragon: 63717 info.

BEAMINSTER
Hand and Head shop, Fleet Street.

BELFAST
Belfast Arts Lab. c/o. 39 The Mount, Belfast, 6.

BIRMINGHAM
Peace Centre, 18 Moor Street, Ringway. 021-429-3203. Books etc.
Action Centre Shop, 134 Villa Road, Handsworth. 523-6891. Mags. info.
Birmingham Free Press, 4p.
8 Park Avenue, B.12.

BLACKPOOL
Search, 93 Abingdon Street, 0253-56528. Info.

BRADFORD
Shaft, C/o. David Brown, Godwin Chambers, 55 Bodwin Street, Bradford, 1. Info.

BRADFORD-ON-AVON
The Other Paper 10p.
30 St. Aldhelm Road, Bradford-On-Avon, Wiltshire.

BRIGHTON
Public House Bookshop, 21 Little Preston Street, 0273-28357.
Unicorn Bookshop, 50 Gloucester Road, 0273-682307.

BRISTOL
Acorn Bookstall, Stall 2, St.Nicholas Market, 1.0272-297508.
Buzz, 10 Whatley Road, B.8. 0272-36117. Info.

CANTERBURY
Response, 43a St. Peters Street, 0227-64949. Info.

CAMBRIDGE
Cockaygne, 1 Jesus Terrace, Books etc.
Students Bookshop, Silver Street.

CARDIFF
RIB, 58 Charles Street, 0222-44441. Info.
Peoples Paper, 8p. 35 Deri Road, Penylan.

CAMBOURNE
Ohm, 5 Beacon Terrace, Cambourne, Cornwall. Cambourne 4472. Info.

COVENTRY
Rank and File Workshop, 30 Primrose Hill South, 51723. Info.

DERBY
Fusions, 96 Abbey Street, 41904. Info.

DOVER
Response, 337 Folkestone Road, Dover, 1126. Info.

DUBLIN
Pushbike, Free. J. Donaghue, 59 Longan Avenue, Santry, Dublin 9.

DUNDEE
Touch, 56 Peddie Street, 0382-643367. Books and Info.

DURHAM
Muther Grumble, 10p. or £1 p.a. Monthly. 13 Silver Street, Durham. 0385-61242. Info. The best community paper in Britain.
Paperbacks, 89 Elvet Bridge.

EASTBOURNE
Bob Gibson, c/o. Continental Coffee Bar, 123 Terminus Road, Info.

EDINBURGH
Roots, 6p. every 6 weeks. 'The focus for non-violent radical activity in Edinburgh'. 6 Lonsdale Terrace, Edinburgh, 3. 031-229-1861.
Cracker, 5p. Fortnightly. Edinburgh's Time Out. 1 Cheyne Street, Stockridge. 031-229-6291.
Grunt, 20 St. Stephen Street, E.3. Books etc.
Better Books, 11 Forest Road.

GLASGOW
Nexus, 15 Hope Street, C.2. 041-221-4750. Info.

GUERNSEY
Oasis, Tower Hill, St. Peter Port. Info.

HATFIELD
Bridges, Old Mortuary, 23 St.Albans Road East, 66834. Info.

HULL
Outsider, 9 Leonard Street, 20222. Info.

LEEDS
Lip, c/o. Anarchist Bookshop, 153 Woodhouse Lane, L.2. Also Info. Same address. 40530.
Books, 84 Woodhouse Lane, L.2.

LEICESTER
Link, 24 Hastings Street, 22254. Info.
Black Flag Bookshop, 1 Wilne Street.

LIVERPOOL
Nib, Stanley House, Upper Parliament Street, L.8.
Liverpool Free Press, 4p, 40p for 6, Monthly. 24 Wapping, L.1.
ARA 8 Percy Street, L.8. 051-709-3211. Info.
Big Flame, (QV politics section).

LOUGHBOROUGH
Headshop, 19 Churchgate, 050-93-67257 Info.

MANCHESTER
On the Eighth Day, 111 Oxford Street, All Saints. Shop + Info.
Magic, 7 Summer Terrace, M.14. - 061-224-9087. Info.
Grassroots Bookshop, 271 Upper Brook Street, M.13.
Mole Express, 10p. Monthly. Nationally distributed. Very well produced. Good on police news. 7 Summer Terrace, Rusholme, M.14 - 061-224-9087.
Manchester Free Press, 104 Bold St., M.15, and at the same address, the Moss Side Press, which prints many alternative mags.

MAYBOLE
Maybole Arts Combine, 42 Ladyland Road, Maybole, Ayrshire.

NEWCASTLE-ON-TYNE
Contacts, via Muther Grumble, Durham.
Ultima Thule, the Arcade, Percy Street, Info. and Bookshop. Only decent leftist bookshop in Newcastle.

NORWICH
Norwich Free Times, Students Union, University of East Anglia.
Bristows Paperbacks, 4 Bridewell Alley.

NOTTINGHAM
Response, 3 Cobden Chambers, Pelham Street, 0602-40701. Info.
Bux, Lincoln Street, Nottingham.

OXFORD
Community Workshop, 19a Paradise Street.
Strumpet, Frevin Cottage, Frevin Court.

PLYMOUTH
Community Workshop, 14-17 Manon Street, Stonehouse.

PORTSMOUTH
Head community Services, 18 Derby Road, North End. Headshop + Info.

READING
Dormouse
Ade, 90a London Street, 72723 + Info.

REDRUTH
Books & Things, 6 Penryn Street.

ROCHDALE
RAP c/o. D. Bartlet, 230 Spotland Road
Beautiful Stranger, 6a Hunters Lane, Yorkshire Street, Info.

SHEFFIELD
Potters House, 16 Backfields, S.1. 0741-26161.

SOUTHAMPTON
Serendipity, 21 Carlton Place, Shop
Mantra, 5p. Monthly. Non-violent action.
Sanvag, c/o. Phil Collins, JCR Southampton University.

STOCKTON-ON-TEES
Help. Stockton 66667. Info.

STOKE-ON-TRENT
Cleveland Wrecking Yard, 175 Newcastle Street, Burslem. 0782-86024. Shop. Info. mag.

YORK
Droop & Browns. 15-16 Fossgate, Shop + Info.
Woof's Stall, Newgate Market (Thurs. & Sat).

LONDON
Community papers etc.

HACKNEY GUTTER PRESS
3p. Centreprise, 34 Dalston Lane, E.8.

ISLINGTON GUTTER PRESS
3p. + post. 33 Windsor Road, N.7.

BITMAN
15p. or £1.50 p.a. About Quarterly.
BIT, 141 Westbourne Park Road, W.11. 01-229-8219. Also info.

STREET AID NEWS
13 Shelton Street, W.C.2. 01-240-1714. Also Info.

MARTIN RICHARDS
Cambridge, September 1972

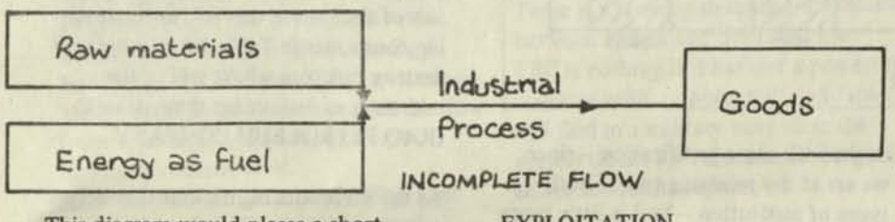
THE OI£ INDU$TRY

Unemotive Exploitation

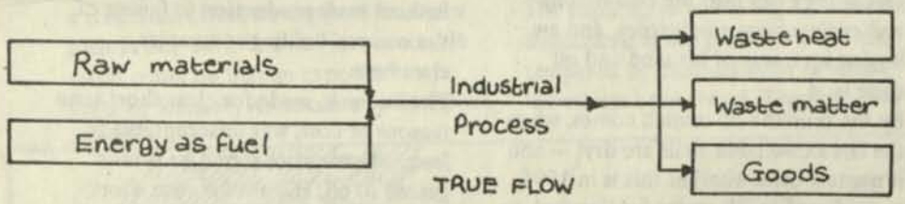
Throughout the millions of years of life on earth, a small store of highly-usable energy has been slowly built up on and within the bowels of the earth.
Man is the first creature in the evolutionary chain to make any inroads whatever on that store.Of the million or so years that he has existed as homo sapiens it is only in the last six thousand that he has made any use whatsoever of stored energy. Originally he used growing timber. Two hundred years ago, having discovered that he was using timber up more rapidly than the Sun and the earth could together replace it, he turned instinctively to fossil fuels.
In the next decade, man is going to use up more fossil fuels than he has consumed in all his history of a million years.

THE NATURE OF INDUSTRY

Industry and *work* are often synonymous. But industry can also be defined as the processsing of energy and matter to produce goods. It can be expressed diagrammatically as follows:



This diagram would please a short-sighted economist who is only concerned with relating the value of the goods to the user at a *particular time in history.*
We should, however, be concerned with the more accurate diagram , which is as follows:



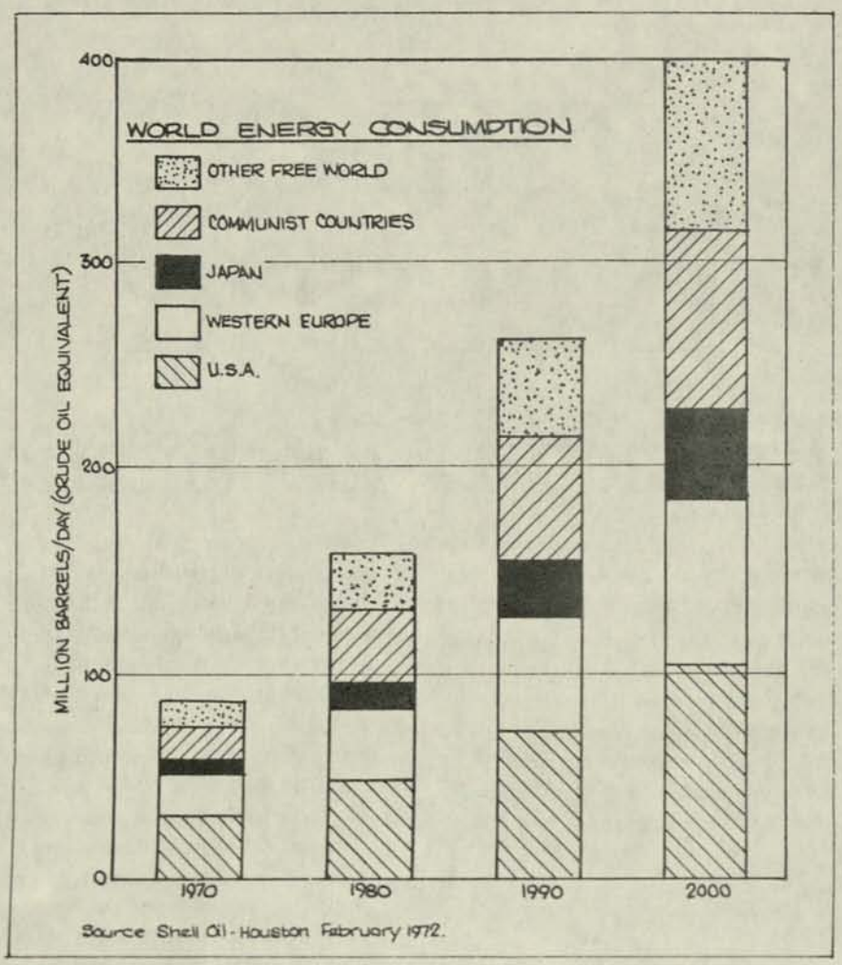
Note that the process is irreversible -- as we should expect from the second law of thermodynamics. The motor car, for example, could crudely be considered as being synthesised from iron ore and fuel. But no amount of fuel energy, in the short term, will recreate the iron ore, although in the long term, after eons, the remains could form part of some future ore deposit, thanks to the continuing energy input from the Sun, which drives the wind, the rain, and the chemical processes needed to convert the steel to its more stable oxidised forms.
We have with us now an economic theory and practice developed in another age and rationalised for a different situation Had some event forced man to stabilise his population and consumption patterns to those of his pre-industrial era, then it is unlikely that the eco-crisis prophesied as almost inevitable within the next 20 years would occur for at least a few more centuries.

Nevertheless, through an industrialisation based on an economic theory of growth, we have temporarily broken though the millenia of recurring poverty crises that man has suffered in the past.Many distinguished writers have described , from the point of view of economics, the great breakthrough that has resulted in the very real increase in the wealth of the *Western* common man.

EXPLOITATION
This emotive word has always been used to describe the unfair distribution of wealth between those who produce wealth and those who 'own' the means of production. Here again, the exploitation of the workers by private Capitalism, as in the West, or by State Capitalism, as in Russia, has been extensively documented.
But I would like to draw attention to another, non-emotive use of the word, as applied by the extractive industries to their own activities.
For example, John Davies, MP, referring to North Sea oil, stresses in Parliament the importance of exploring for, and *exploiting*, our resources as quickly as possible. It is curious that while we use the term emotively in the context of worker-owner relationships,or in describing the developed nations' relations with underdeveloped nations, we generally find no difficulty in accepting as non-emotive its use when applied to natural resources.
Expressed in its simplest terms,trade between human beings represents the relative and arbitrary value of labour exchanged for goods -- though this statement is a gross simplification.

But take the case of an American businessman or civil servant.
For no good reason, other than an accident of birth, more than 10 million Americans today own more than £25,000 each, and earn over £10,000 per annum, while hundreds of millions of Indian peasants own nothing and live on an income of 7½p a day.
Any trade between an American and an Indian on the basis of these wages is obviously unequal and therefore exploitive.
Similarly, the developed countries' gross indifference to a whole range of unfair and exploitive trading situations with underdeveloped nations -- from coffee to cocoa to copper to oil -- was well catalogued at the UNCTAD conference in Chile this summer.
But if this is wrong, then how much more so is the situation where one generation exploits world resources at the expense of succeeding ones?The most important of all resources is fuel -- and in particular, fossil fuel -- because fuels, easily usable energy, are at the heart of all industrial processes.
They provide the key to the well-being of participants in industrialised societies, which means all of us, and our children, and their children .....

THE CURRENT ENERGY SITUATION
We are in the middle of an unprecedented energy-consuming situation.
Again, I don't intend to dwell on matters written-up and discussed adequately elsewhere.
Neither do I intend to explore the possibilities of alternative energy-creating fuels -- such as Nuclear fuels.
Both in England (Royal Commission on Pollution) and in America, Nuclear power programmes are under heavy attack, mainly because of the problems that arise from the storage, cooling and accumulation of noxious radioactive wastes, some of which will remain dangerous for 24,000 years -- four times longer than the recorded history of man.
Solar energy sources, besides being extraordinarily space-consuming, are only applicable really to sunny countries.
And some of the more bizzare ideas for windmills appearing in alternative technology articles make Nuclear power stations look benign in comparison.



It is regrettable, but true, that for the moment, give the current economic wisdom and because of the extraordinary greed of Western consumers, we are hooked irredeemably on fossil fuels, chiefly coal and oil.

Because oil is so easy to extract in relation to other sources, we are at present exploiting it with such indecent haste that a Martian watching the operation might be forgiven if he thought that perhaps we were worried in case the sources would evaporate away if exploitation were delayed a year or so.

Last year, world production of oil was 2,486,315,000 tonnes, a 6% increase over the year before.

In 1950, UK refinery production amounted to 11,5 million tonnes per annum. Only 21 years later, it had risen to 121 million tonnes.

Petroleum Review sadly contrasts our "poor" growth rate with that of Japan, which in 1950 was refining only 2,6 million tonnes per annum, against a staggering 185 million tonnes per annum last year.

One would have thought that since the limits of the world's oil reservoir are well-known, there would be a move among the oil companies at least to conserve their resources. Similarly, it would have been encouraging if Governments had recognised that with the increase in use of the internal combustion engine the quality of the environment, and hence of living, had noticeably deteriorated.

But since neither has happened, we might with some justification -- since we are at the receiving end of both types of institution -- look a little more closely at the industries responsible for the exploitation of fuel resources.

Let us first turn our sights at the most important of the group -- the oil companies.

These companies are diversifying as fast as they can into the coal-mining and nuclear power industries, and are buying up tracts of tar sand and oil shale land.

By the time the oil crunch comes, when the last exploitable wells are dry --- and it matters little whether this is in 1995 as predicted in *Blueprint for Survival*, or in 2020, the time is so short -- these companies will literally control all the basic means of all further production.

Energy is " the capacity of a system to do work," but the corollary is equally true --- a system cannot do work *without energy*.

THE OIL COMPANIES

In the days when these corporate giants, albeit not as big as they are now, monopolised the world-wide marketing networks, they had the power to make and break governments and rulers.

With their splendid instinct for survival --at least in the mid-term– they are now warning the conservative politicians of Western countries and Japan that their growing dependence on imported oil supplies, which can be cut off in an emergency, has considerable political significance.

For the truth is that God, with delightful irony, has deposited the easiest-to-get-straight-out-of-the-ground variety of oil in the politically most volatile part of the world, the Middle East.

This region also contains 61% of all known reserves: 16 times more than all European reserves. It supplies 60% of present world production, and by 1980, with present trends continuing, should be supplying 70% of world production.

The shipment of this oil in such large quantities is responsible for the already serious and still growing problem of oil pollution of the oceans.

But in the meantime, by observing the techniques of Western cartels, the oil producing nations themselves have formed a cartel -- the Organisation of Oil Producing and Exporting Countries,known as OPEC. At present the Saudi Arabian representative heading the group, Sheik Ahmed Zaki Yamani, having successfully raised oil prices, is now haggling for and will obviously win for the oil producing nations a 20% equity in all native company operations. Only the terms and prices remain to be settled . It is the aim of the "seven sisters", as the seven big companies in Table 1 are known, to destroy this plan which will in the mid-term so undermine their strength.

IRAQ PETROLEUM COMPANY

As the oil producing nations themselves take an ever-increasing share in the "upstream" operations of the seven major companies, the recent takeover by Iraq of the Iraq Petroleum Company can be seen as symbolic of the future.

IPC, in response to the demands of its owners -- mainly BP, CFP and Esso-- had cut back production in favour of the owners' holding companies elsewhere.

The cutback, made for clear short-term reasons of cost, was unacceptable to Iraq, whose national budget is now geared to oil. Her answer was short, sharp and decisive -- a takeover which had the full support of OPEC.

On the face of it, OPEC would appear to be a thoroughly good thing, with the oil countries taking a real interest in the commercial value of what is sometimes their only saleable asset.

But because of a recent split in the ranks, caused by the defection of the Shah of Iran,and the general "get rich quick at the expense of all else" mentality pervading the group, not much change can be expected out of them.

To my knowledge, the only member state to have shown any concern for the long-term position of its reserves is Kuwait. Last year Kuwait forced the Kuwait Oil Company -- owned in equal parts by BP and Gulf -- to shelve indefinitely its plans for doubling the export of oil from the Burgan field.

On the other hand it seems that Saudi Arabia's prime producer ARAMCO -- composed of Jersey Standard, Mobil

HOW THE INTERNATIONAL OIL GIANTS PERFORMED IN 1971

	sales ($billions)	net income ($millions)	profit on sales (%)	return on investment (%)	employees (000s)	sales per employee ($000s)	common dividends ($millions)
JERSEY STANDARD	18,7	1516,6	8,1	11,5	143	130	851,0
ROYAL DUTCH SHELL	12,2	847	5,4	9,2	185	66,2	454,0
MOBIL	8,2	540,8	6,6	9,7	75	109,4	258,8
TEXACO	7,5	903,9	12,0	11,0	75,1	100,1	435,7
GULF	5,9	561,4	95	8,3	57,2	103,8	312,0
STANDARD OF CALIFORNIA	5,1	511,1	9,9	9,7	42,5	120,9	237,4
BRITISH PETROLEUM	5,1	357,0	6,9	8,6	unavailable	unavailable	182,0

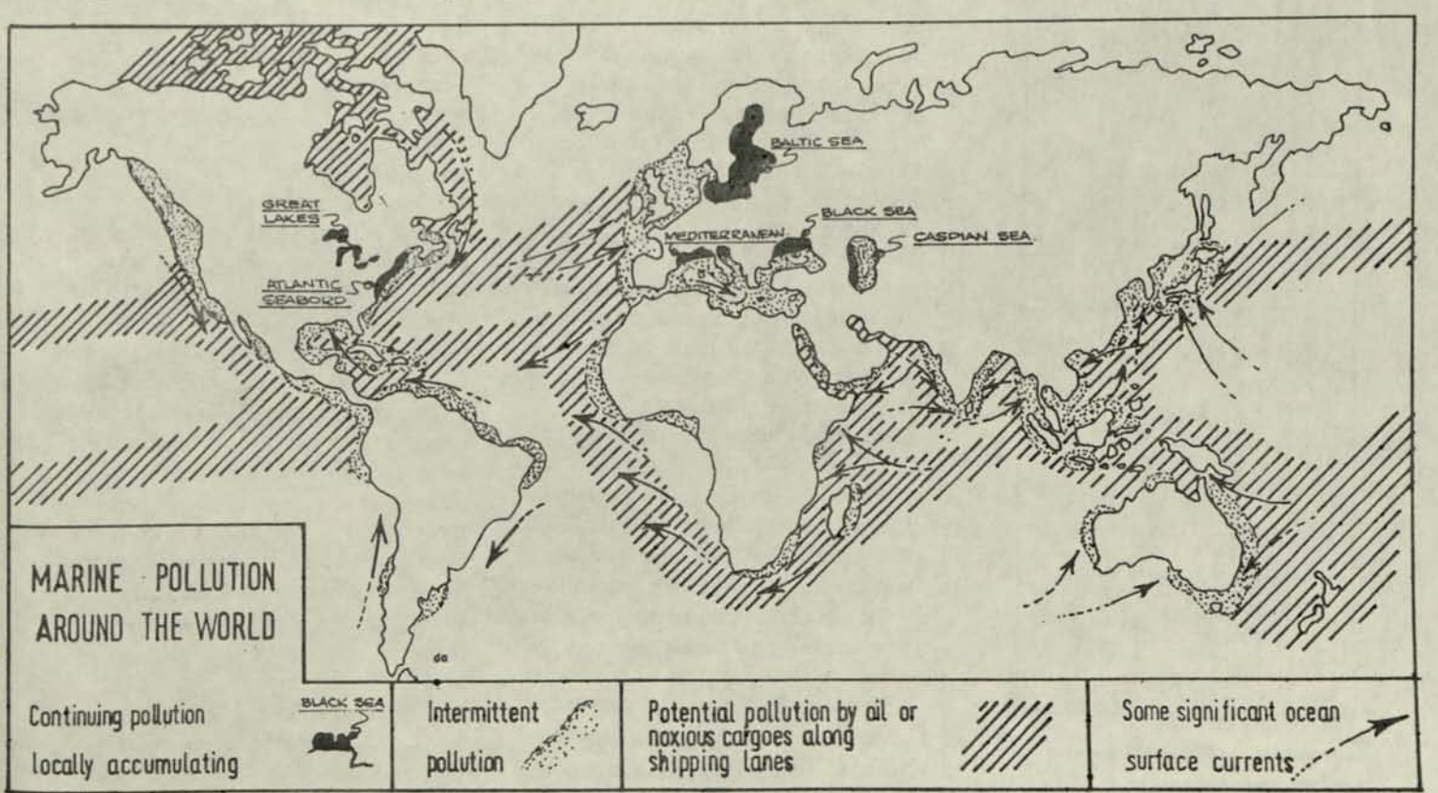
Data: Investment Management Sciences Inc.

and Standard of California -- although intent upon getting a larger slice of the cake, is also determined to get rid of the cake as quickly as possible by increasing the number of exporting facilities at R'as Tanura in the Arabian gulf.
However, given the world-wide interest in conservation, the more responsible OPEC chiefs may recognise that they have long term responsibilities to succeeding generations and may level out the flow from their rapidly depleting reserves to a more realistic level.
Since they are almost entirely Islamic in religion, it is possible that the moral force of the conservation arguments will have more effect on them than on the erstwhile Christian communities of the West.
Cutting back on oil production or even levelling such production off will have a traumatic effect on developed nations such as our own. One not-inconceivable result could be that an expeditionary force of Russian, American and European servicemen, backed with money from Japan, could seize primary strategic oil fields and exporting facilities within the decade following such a cutback.
The signs are already written on the wall.
There is a growing detente and collusion between Russia and the USA; the EEC is nothing if it has not a powerful cohesive military potential; and Japan will find in a military adventure the perfect outlet for its expansionist tendencies and limited space.

As UNCTAD clearly showed, these nations -- and OPEC too -- will let the rest of the world go hang itself.

NORTH SEA OIL

The euphoria over the big finds recently announced in the press has not been tempered by consideration of *where* the oil has been found. The first field announced -- the Philips Ekofisk field development -- has endured delay after delay, at huge cost. Between October 1971 and Spring 1972, only three of the huge piles that pin the big production platform to the sea bed had been driven by Santa-Fe Pomeroy from their very advanced construction barge, the *Chocktaw*, using the finest construction plant available.
And the Philips field, located in water depths of only 220 ft, is much more favourable in terms of water depth and marine environment than the Forties field (BP) or the Brent field (Shell/Esso). The former is in 330ft of water and the latter in over 400ft.
Between Winter 1971 and June 1972 the cost estimate for producing the first phase of the Forties field development went up from £176 million to £220 million without a pipe being laid or a pile being driven. The average price for producing an equivalent on-shore development would be something less



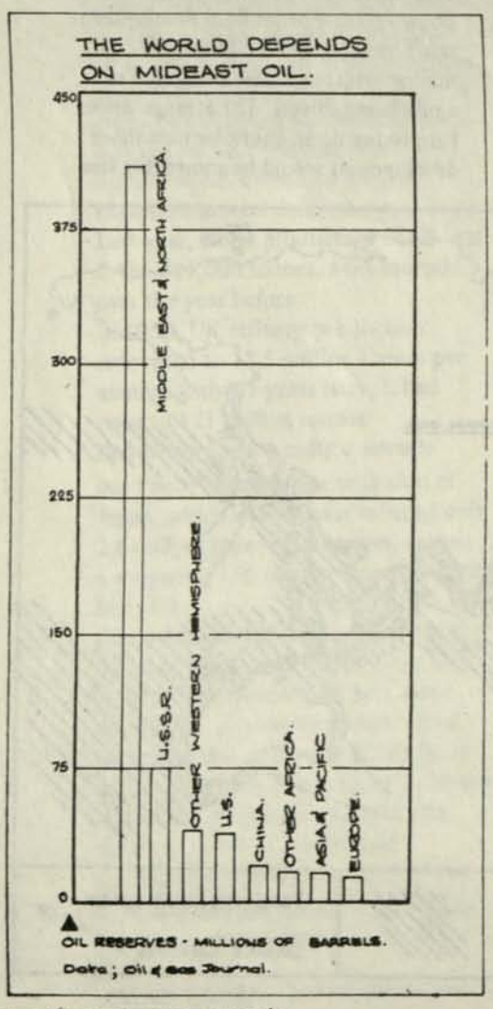
than £12 million.
And the North Sea's proven reserves still only contain 1% of Mid-East reserves .

ALASKA NORTH SLOPE

The total measured reserve in all the North Slope fields is estimated at no more than one year's increase in normal world production. The project has already cost the oil companies collectively £800 million and the chances of any production by 1978 are slim.
Originally, plans for the pipeline gave scant thought to the environmental problems that it would create. Now, the estimated cost of the pipeline alone, giving due regard to its environmental acceptability, has tripled from $300 million to $900 million. The project is still being challenged by environmentalists and could increase in cost as much again.

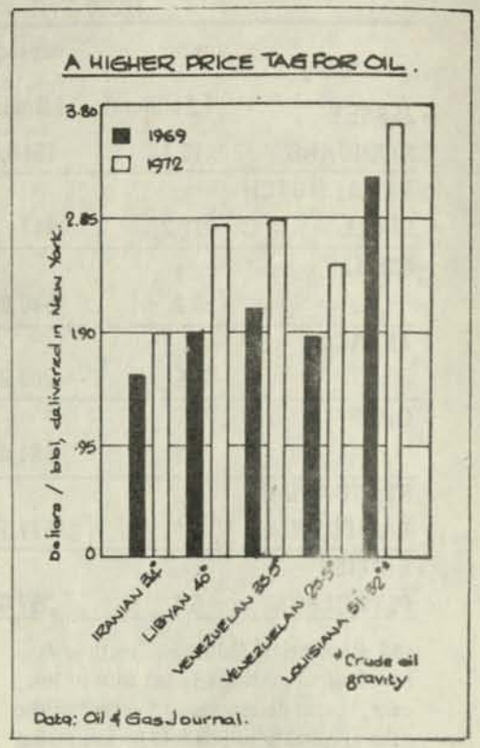
THE ARCTIC ISLANDS

Given that the US oil companies interested in this region can satisfy the incresingly-stringent environmental demands of the Canadians, the present guess at the cost of producing the estimated 2,7 billion barrels yield of oil from this area is $8 billion, with a selling price of $ 4 per barrel. At present, the dearest crude oil in the world --from Louisiana-- costs $3.7 per barrel. And as we have seen in the North Sea and Alaska, first estimates are nearly always wrong.



SUMMARY

1.The remaining world oil supplies are essentially limited. Production and exploitation of the oil shales, tar sands and remaining coal deposits will be expensive -- many times more expensive than even the remote Western oil fields -- and environmentally catastrophic, from the point of view both of pollution creation and of land sterilisation.
2.A levelling-up in the consumption of oil by the developing nations to developed-nation rates will ensure that the remaining stocks will dry up well before the end of this century. At the moment, 5% of the world's population, in the USA, is consuming 30% of the world's annual production. In Europe, the per-capita consumption is even higher in Sweden than in the USA (where it is over three tons per head), and the rest of Europe is catching up as quickly as it can.
3. The only "clean" nuclear power source-- a sort of controlled H-Bomb -- is still 30 or 40 years off in the future.
In any case, there are serious problems arising from the surplus heat of such projected plants -- problems that will make present day thermal pollution look the very paragon of environmental virtue.
4. And yet the human race in its present concentration and numbers is irrevocably hooked on industry and is hence dependent on fossil fuels.
One cannot even make a spade or bucket without fuel and materials. All our prime building materials , due to their manufacturing processes, have a very high fuel energy content.
5. What *is* expendible in the human equation is the concept of growth.
Although populations will have to be curbed--and people everywhere are going to have to *diminish* their populations, just for the sake of the survival of the species--the most damaging element is that of economic growth.
6. The seven major oil companies whose financial results are listed in Table 1 are between them responsible for the production and distribution of 50% of the world's oil.
The seven corporate boards could, between them, take the most radical and welcome step of declaring a moratorium on further expansion of their industry. By so doing, they would ensure that the rest of industry would fall into the same line of zero growth.
7. Such a step should only be the first. Developed nations, to cease exploiting their global neighbours, must declare that the cake has finally ceased growing and announce a more even share all round.
8. Accepted fuel-consuming devices should be examined, and, where necessary, discarded.
Of the enormous American fuel consumption last year, over 3 tonnes per head, 43% was expended on motor cars. Air transport is a great fuel user and



polluter. Power stations are huge and highly-inefficient fuel consumers -- even the best power station built today has a thermal efficiency of less than 40%. Such stations are also great polluters.

CONCLUSIONS

1. Though it may appear " retrogressive" to some, I believe we should first of all attempt to cut back fuel usage to levels somewhere equivalent to those of the mid or early Fifties.
By so doing, we in the developed countries would be maintaining the world's really cheap fuel supplies for a lot longer, we would be sacrificing nothing in terms of life quality, and would be giving the developing countries a "breather" in relation to their own heavy problems.
2. I see no possibility of either our governments or the oil majors contributing to this proposal.
I maintain that such ideas will have to be advanced and enforced by the developing nations themselves, among which are all the OPEC countries.
I therefore suggest that the force of the environmental analysis be directed at these primary producers, where the fear of redistribution of wealth does not have the same strength as it does among the developed nations.
3 Meanwhile, as individuals and ecological evangelists, we can at least be ourselves aware and sensitive to the consumption patterns of our age. We can best undermine the power of governments and corporations alike by *resolutely refusing to consume.*
The seeds of such a movement are already growing -- but they will have to spread like hot gospel to gain any real hold.
4. If we pursue these policies the rewards are great -- a better life in the short term and survival itself for succeeding generations in the long term.

Hugh Sharman

Alternative Technology Guide

→ Research Unit, University of Sussex, Brighton, Sussex). Other material on China can be obtained through the Society for Anglo-Chinese Understanding (SACU), 24 Warren St, W.1.

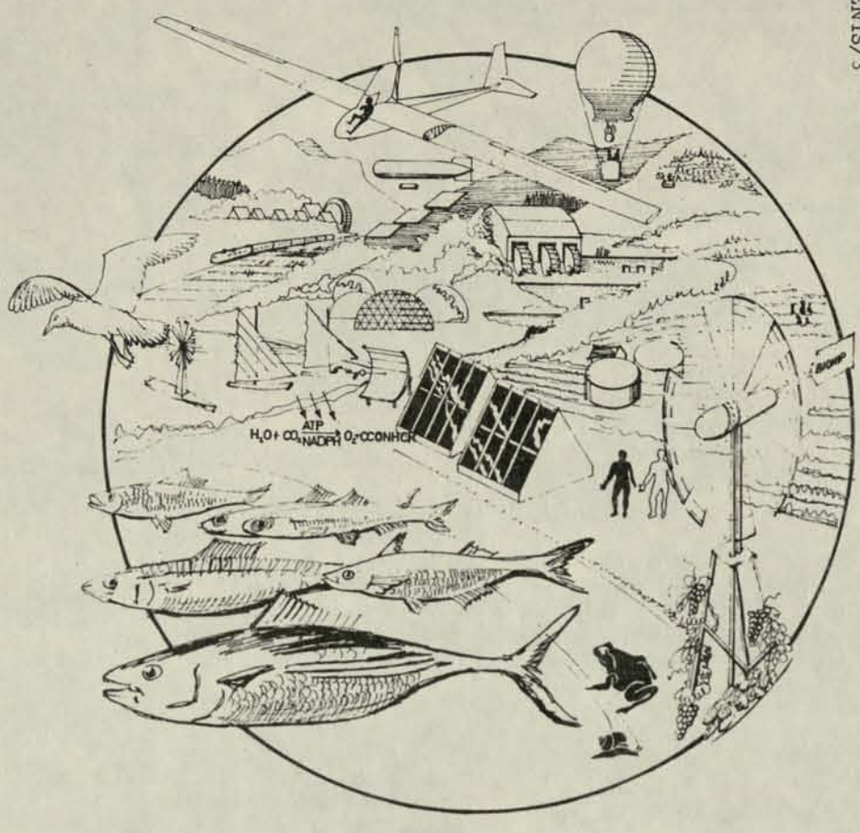
COMMUNITIES

The real test of alternative technologies is in application to real economies, and a relatively self-sufficient economy based on a fairly small rural community appears to be the most practical kind of test-bed at the moment. Most existing "intentional communities" are not particularly concerned with technology or asking themselves the question "what if everybody did it?", but any community is gaining valuable experience in the social problems raised by such a life-style. In Britain there is a formal "Commune Movement" (Bob Matthews, 88 Strathmore Avenue, Hull), which produces a Directory of Communes and a bimonthly journal Communes (both from Patty Dorman, 3 Russell Way, Wootton, Bedfordshire). Clem Gorman's Making Communes (Whole Earth Tools, The Mill Cottage, Swaffham Rd, Bottisham, Cambs.) is a general survey with a useful bibliography. In Europe, Commune Bulletin (William Tellstraat 8, 9000 Gent, Belgium), in the USA, The New Utopian (2441 Le Conte Avenue, Berkeley 94709) and Modern Utopia (1526 Gravenston Highway North, Sebastopol, California 95472). An extensive bibliography on intentional communities is to be found in Dick Fairfield's Communes USA (Penguin 1971 (121 W. Center College Street, Yellow Springs, Ohio 40017).

In the last century, Communards seemed much more technically-minded. An exhaustive catalogue of historical communes is W.H.G. Armytage's Heavens Below: Utopian Experiments in England, 1560-1960 (RKP 1961). Another good book is Robert Owen and the Owenites in Britain and America, by J.F.C. Harrison (RKP 1969) which has a scholarly bibliography on Owenite communities, and The Utopian Vision of Charles Fourier, edited by Jonathan Beecher & Richard Bienvenu (Cape, 1972).

For further information on the "back to the land" movement in the last century, including a great deal of fascinating technical material, contact Jos Kingston, 10 St John's Terrace, Lewes, Sussex.

On "homesteading" in the old sense, TMEN No 2 reprints a delightful 50's period piece called "The Have More Plan", otherwise the sources given at the beginning contain all necessary references. For comments on modern homesteading (inspiring type) Living the Good Life by Helen and Scott Nearing (Schocken, 1960), and (wry type) Total Loss Farm, by Raymond Mungo (Dutton, 1970).



On the technical aspects of constructing relatively self-sufficient economies using alternative technologies, we know a number of schemes in progress and there must be many more that we have not heard about. Janine and Robin Clarke's "Soft Technology Research Community" is described in the last issue of Undercurrents (No 2), based on their 50 acre site in Wales. A similar scheme has been described by Stefan Szczelkun and colleagues in their "Autonomous Community Workshop" proposal. The article "Alternative Rural Development", in ADDS, summarises a very competent piece of work carried out by Nick Roberts and John Hodges while students at the Architecture Association (Hill Farm, Stockley Hill, Vowchurch, Herefordshire). In Cornwall, a group called "Low Impact Technology Ltd" has just started work: contact Peter Bunyard and Andrew MacKillop, Lawellin, Withiel, Bodmin, Cornwall. John Wood (see above) has produced an attractive poster-size schematic for an "eco-unit".

In Sweden, we worked on another rural redevelopment project ("Baggbo Production Collective") trying to overcome the formidable problems of the Swedish winter (contact Björn Eriksson or Rasmus Jernelius, Valhallavägen 36, Stockholm). Similar projects are in progress (or not, as the case may be) in Holland: Sietz Leeflang, Rinie van den Brand and Roel van Duijn (addresses above) are all involved in different projects. There is also a group at the Technological High School in Enschede (Frits van den Berg, c/o Centrum Mens en Techniek, THT, Enschede, the Netherlands). In Denmark, Carl Herforth (see above) has been working with a group in Northern Jutland who seized some government land in order to begin farming it.

Something about small communities is going on at the Peace Research Centre of the University of Lancaster, but we don't know what yet; the same goes for the Friends World College in East Anglia (George Delf, The Rookery, New Buckenham, Norfolk NOR 04X).

ANTIQUITIES AND RURAL CRAFTS

This is just a rag-bag of things we couldn't fit in anywhere else. And if Jane Jacobs is right, "rural crafts" is wrong (see The Economy of Cities, Penguin, 1968 for an antidote to urbanophobia).

We got interested in antiquities and the history of technology because they showed comprehensible and controllable ways of doing things, and gave us an idea of what could be done under the very different conditions of pre-industrial culture. The Science Museum in London is

full of fascinating hardware, much of it operating, and the Museum library is very strong on technological history. The literature is extensive; samplers: Prehistoric Europe: the Economic Basis, by Graham Clarke (Methuen 1952); The Bog People, by P. V. Glob (Paladin, 1971); Technology in the Ancient World, by Henry Hodges (Penguin, 1970); The Oxford History of Technology (5 Vols, OUP); Science and Civilisation in China (CUP 7 vols).

Specific areas: preindustrial building and power generation were dealt with under the appropriate sections. On Metallurgy: Pirotechnia, by Vanoccio Biringuccio (MIT Press, reprint) and De Re Metallica by Agricola (Dover, reprint: woodcut illustrations quite outstanding). On the early industrial period, Mechanization Takes Command by Siegfried Giedion, OUP 1948; Dictionary of Arts, Manufactures and Mines, by Andrew Ure (1840: K.R. Drummond, 30 Hart Grove, Ealing Common, London W.5 3NB); various volumes of the Library of Industrial Classics published by Cass; Eric Sloane's A Museum of Early American Tools (Funk and Wagnell) - describing also how they were made; and George Sturt's classic The Wheelwright's Shop (Cambridge UP 1963).

On more rural things, SS1 and SS2, CoSIRA, Alicia Bay Laurel's Living on the Earth, Country Bizarre (for all these, see above); The Book of Country Crafts, by R. W. Johnston, (Barnes, 1964); and The Foxfire Book, edited by Elliot Wigginton (Doubleday Anchor) in which "a highschool teacher in the Georgia Appalachians has his students interview their grandparents". On weaving and dyeing, see clothes section. On Pottery, Country Bizarre No 8; Experimenting with Pottery, by David Green (Faber); A Potter's Book, by Bernard Leach (also Faber); and Kilns, by Daniel Rhodes (Chilton Book Co, 1968). On Glass, The Encyclopaedia of Working with Glass by Milton K. Berlye (Oceana, 1968); on paper, Paper Making, by Dard Hunter (2nd Ed., Knopf 1947); on charcoal: The Construction and Operation of Charcoal Kilns Forest Products Research Laboratory, HMSO 1945; on fibres: "The making of straw ropes", Proc of the Society of Antiquaries of Newcastle, 11 (10)

416, (1950) -- we recently entered this for a reference competition and it won an honourable mention; Cordage and Cordage hemp and fibres (Pitman) by T Woodhouse and P Kilgour; "Weaving with marram grass", by M W Hereford, Country Life June 21, 1956; Canework, by Charles Crampton (Dryad Press, 19th Ed. 1966). Courses on many of these crafts are run by West Dean college, West Dean, Chichester, Sussex; and there is a Museum of English Rural Life at the University of Reading, Whiteknights Park.

PHILOSOPHY

There is no really consistent line of thought lying behind all these sources. What does it all mean?
This section concerns those theoretical works which have helped us to make sense of it all.

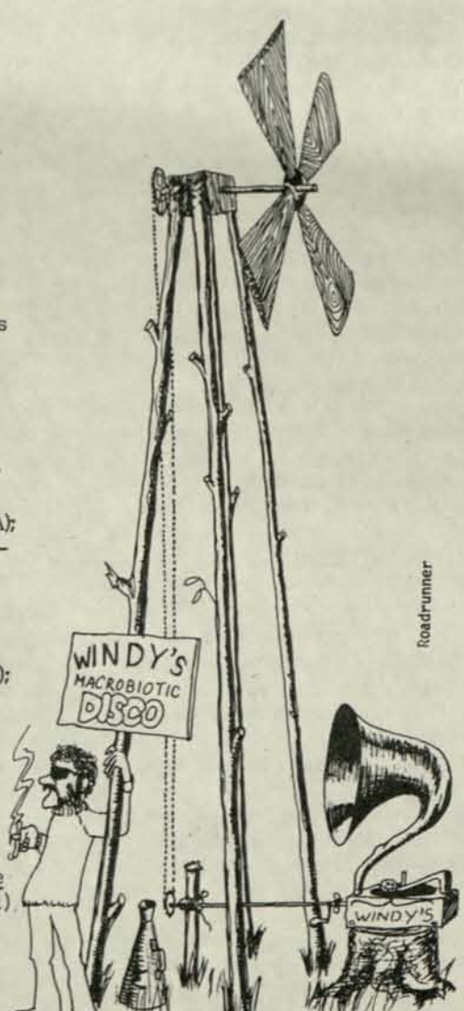
Critiques of the current relationship between technology and society: One Dimensional Man, by Herbert Marcuse (Sphere, 1969); the Pentagon of Power by Lewis Mumford (Harcourt, Brace Jovanovitch 1970); The Technolo Technological Society by Jacques Ellul (Knopf, 1964); The Making of a Counter Culture by Theodore Roszak (Faber 1970); Scientific Knowledge and Social Problems, by J R Ravetz (Oxford UP, 1971); Towards a rational Society by Juergen Habermas (Heinemann 1971).
Most of these critiques are in humanistic or political terms. The ecological line of attack is pursued strongly in the following: Ecology and Revolutionary Thought, by Murray Bookchin (Anarchos, Box 466, Peter Stuyvesant Station, NY, NY 10009, USA); Beyond Repair: the Ecology of Capitalism by Barry Weisberg (Beacon, 1971); Murderous Providence: a Study of Pollution in Industrial Society (Rupert Hart-Davis, 1972); the Closing Circle by Barry Commoner (Cape, 1972); Socialisation de la Nature by Philippe de Saint-Marc (Stock, Paris 1972); and The Costs of Economic Growth by E J Mishan (Penguin, 1970).
A bibliography of recent sources on environmental matters can be found in the first issue of Science for People (BSSRS, 9, Poland Street, London WC1)

The following contain more specific proposals for change: Towards a Liberatory Technology by Murray Bookchin (Anarchos, Box 466, Peter Stuyvesant Station, New York NY 10009, USA); Living the Good Life, by Helen and Scott Nearing (Schocken, 1960); Design for the Real World, by Victor Papanek (Thames and Hudson, 1972); The Movement Towards a New America, edited by Mitchell Goodman, (Knopf, 1970); Strategy for Labor, by Andre Gorz (Beacon, 1967); Workers' Councils and the Economics of a Self-Managed Society (Solidarity Pamphlet No 40, 27, Sandringham Road, London NW11; "Buddhist Economics" by E F Schumaker, Resurgence 1 (11) 1968); the Liberation of Work, by Folkert-Wilkins (RKP, 1969); A New Life on the Land by George Woodcock (Freedom Press, 1942); Fields, Factories and Workshops by Peter Kropotkin (1899); Walden by Henry Thoreau (New American Library, 1960); Communitas: Means of Livelihood and Ways of Life by Paul and Percival Goodman (Random House, 1960); Design with Nature, by Ian Mc Harg (Doubleday, 1969); On Learning and Social Change, by Michael Rossman (Vintage, 1972).

See also references on China in section on Third World. The writings of Marx and Mao are also apropos, although their authors might be surprised to hear it said in this context.

Peter Harper
Bjorn Eriksson

BRIGHTON AND STOCKHOLM,
September 1972.



ALTERNATIVE TECHNOLOGY

A GUIDE TO SOURCES AND CONTACTS

THIS GUIDE IS a modified version of one compiled for an exhibition called "Towards a People's Technology", held in Stockholm, June-August, 1972. Naturally it's biased in all manner of ways, not least by the accidental nature of what we have discovered and whom we happen to have met during a relatively short acquaintance with the "subject". It's also premature in that we have not followed up many of the leads yet. Later versions are certain to reflect a different balance and we welcome comments of any kind. The guide is supposed to be complementary to Martin Richards' guide to alternative periodicals, also in this issue of UNDERCURRENTS.

WHY ARE ALTERNATIVES TO PRESENT-DAY TECHNOLOGY NEEDED?

The profit system has given rise to a particular class of technologies that are extremely productive and permit the creation of a spectular variety of goods and services. These types of technologies are not specifically designed for the fulfilment of other requirements than sheer productivity, and only satisfy real human needs indirectly, if at all. There is nothing intrinsically wrong in this, but many important human goals are actually frustrated by conventional technologies, which tend to involve tedious work conditions, do not lend themselves to control by either producers or consumers, waste large quantities of non-renewable materials, and disrupt the environment. Attempts are currently being made to soften the corners of conventional industrial technologies in order to reduce overt exploitation of people and nature. If these efforts are made in conjunction with a change in the social locus of power over production and technology, they may in the end work - who knows? But perhaps it is to tackle the problem the wrong way round. Why start from a basis of processes which are designed to do something else? Why not create technologies which are designed to satisfy directly human needs other than productivity and profits? Productivity is certainly an important factor, but what happens if it is given a lower priority?

We find ourselves faced with a whole zoo of "alternative" gadgets, materials, skills, processes, principles and philosophies, many of the inhabitants of which have been described under such names as

New Alchemy
Soft Technology
Ecologically-based Technology
Biotechnics
Radical Hardware
Appropriate Technology
Intermediate Technology
Humane Technology
Liberatory Technology
People' Technology ...etc.,

each having a different primary focus, emphasising for example

workers' control
low specialisation
demystification of expertise
reform of work-roles
local or regional self-sufficiency
balanced economic development
development under conditions of low capital
community cooperation
subversive activity
resource conservation
low energy-use
environmental stability
recovery from possible industrial collapse
reduced technological risks ...etc.

It is hard to claim that all these add up to a coherent programme, but they seem to us to be groping in roughly the right direction, all tending to go against the modern thrust to increase the power and "sophistication" of technology as if for its own sake, irrespective of other human goals. We think the people working on all these different lines have a lot to learn from each other, and we ourselves would like to draw on the experience of all these "schools".

THE POLITICAL DIMENSION

One of our primary concerns is the connection of the development of alternative technologies to the political struggle. We think it is worth trying to develop technologies that are simple enough for ordinary people to involve themselves in, so that they can to a greater extent provide themselves directly with the things they need, rather than rely on the commercial apparatus of experts, advertisers, middle-men, packagers, bureaucrats, etc. These kinds of technologies can best be developed in production-collectives in the countryside. Such collectives could have an important function in preparation for post-revolutionary society. Ways of organising a collective life, fully participatory production, and technologies developed for this way of life, will prove extremely valuable when the time for fundamental change of economic relations has come.

Although there is a rural bias to much of our material, it is just as important to find ways of living in the city without getting trapped in the commercialised environment, in order to support vital political activity. Also, changed forms of factory technology should be considered if they can serve as instruments for rallying the workers in a struggle against the owners and managers of the plant. Counter-technologies such as wire-tap detectors or teargas antidotes and, in the appropriate political circumstances, guerilla warfare, may all fall within the general rubric of alternative technology.

The specific areas which we pick for active research range from the immediately practicable to the frankly utopian. Although it is important to keep one's feet on the ground, it is often difficult to be sure where the ground is, and ideas pursued merely because they are interesting, or just fun, may in the end prove as useful as more rigidly planned inquiry. Certainly there are no final answers here, but perhaps stepping-stones towards a goal which, given the right political and cultural changes, we believe to be technically achievable.

ON PRODUCTIVITY

In the countryside at least, we are aiming at technologies based on decentralised processes using ambient energy and local materials, operated by and for relatively small communities. Once the basis principles of a particular "alternative" process are worked out, we try to modify them in order to make them more productive and efficient - but never at the expense of the original "human" goals.

Can we really relegate productivity to a secondary place like this and get away with it? Obviously when productivity is so low that even the basic necessities cannot be provided, increasing production is the primary need. But once the basic necessities, and a little more, are assured, the problem ceases to be one of sheer quantity, but of the quality of productive effort, the distribution of goods, and the uses to which the goods are put. "Economics" will not be abolished, but as long as our technologies can yield at least a small surplus, they can claim a certain rationality for satisfying real human needs and, in certain (to us very important) respects, a rationality superior to that of conventional technologies. The question is, can they be made productive enough granted that they may never be as productive as technologies built especially for high productivity?

We think that alternative technologies can be made very productive, but we have to admit that many of the proposed schemes look unpromising. Although we can (and do) make use of "advanced" technology, many of the processes that interest us look a bit too quaint to be practical; primitive perhaps, or simply comical. Some people find this attractive, others not. Each to his taste. But one should not be mislead by impressions. The intention is not to "go back", but simply to use all the knowledge we have to create fully human technologies. It just so happens that part of our knowledge is of non-industrial techniques often associated with wild and far-off times and places. Such techniques often fulfill the primary conditions of local control, resource conservation, etc., and it is our job to develop these in the light of the knowledge we now have. It should not be assumed that such technologies necessarily reached a dead end, under the conditions of limited knowledge and social repression that originally surrounded them.

None of the changes we advocate should be isolated from other necessary changes. We are in complete accord with traditional radical thought in insisting that the relations of production be changed, but we think that this alone is insufficient for the creation of societies that are both humanly fulfilling and in balance with their environment. The means of production themselves must be changed. Technological change is no substitute for social and political change, but a necessary complement to it.

CONTACTS AND SOURCES

General

If you are interested in this stuff, you are invited to contact, in the first instance, either:

Björn Eriksson, Bybacken 1, Värmdö, SWEDEN, or
Peter Harper, 17 Brunswick Place, Hove, Sussex.

Eriksson, originally an engineer, is working with an alternative technology group at the University of Gothenburg. Harper, originally a biologist, is working on a survey of alternative technologies for UNESCO.

In Britain, the following folk are working more or less full-time on alternative technologies:

Peter Bynon, 9 Langbourne Avenue, London, N.6. Design of self-sufficient communities; architect.
Graham Caine, 135 Fairbridge Road, London, N.19. Building an "eco-house" in south London; militant street farmer.
Robin and Janine Clarke, 8 Lambert Street, London, N.1. BRAD (Biotechnic Research and Development) Group setting up 50-acre site in Wales. Robin was formerly editor of Science Journal.
Bob Congdon, Intermediate Technology Development Group, 9 King Street, London, W.C.2. Alternative technologies for Third World application.
David Dickson, 10 Chalcot Square, London, N.W.1. Researching a book on alternative technologies; former General Secretary of BSSRS.
Andy McKillop, School of Environmental Studies, University College, Gower Street, London, W.C.1. Running a course on Biotechnic housing; producing a series of orientation papers under the imprint "BLUP" (Biotechnic Land Use Publications); now starting an ecological technology company in Cornwall.
Colin Moorcraft, 48 Westbere Road, London, N.W.2. The "recycling correspondent" of Architectural Design working with Graham Caine on the eco-house.
Kit Pedler, 119 Park Hill, Clapham, London, S.W.4. Former medic, creator of "Doomwatch", now dropped out and specialising in domes and windmills.
Chris Ryan, 32 Lower Road, Fetcham, Surrey. Hairy Australian physicist, editor of Science for People magazine, working on an alternative technology film.
Stefan Szczelkun, c/o Manygate Lane, Shepperton, Middx. Author of Survival Scrapbook series, professional nomad, working on the design of an "autonomous community workshop".

It might also be worth contacting the following to see what they're up to:

Mick Bedford, 45 Farrer Road, London, N.8. Biotechnic houses for suburbia - and beautiful draughtsmanship.
Robin Fielder, 71 Thirlwell Road, Sheffield; starting a "community science" technical collective.
Ian Hogan, 113 Warwick Avenue, London, W.9. Another BLUPster.
Gerald Leach, 3 Tanza Road, London, N.W.3. Science correspondent of Observer and secret alternative technology addict.
Martin Richards, 57 Selwyn Road, Cambridge. Professional baby-psychologist, running a course on alternative tech
alternative societies at the University of Cambridge.
Harry Rothman, 51 Sherwood Avenue, Manchester 14. Had a chapter on alternative technologies lifted from his recent book Murderous Providence. Says publisher, "you must be joking". Ho ho ho.
Andrew Singer, The Mill Cottage, Swaffham Road, Bottisham, Cambs. "Whole Earth Tools" alternative publishing.
John Wood, Eco-Unit Research Group, 899 Kingsway, Manchester M20 OPB. Design for a relatively self-sufficient living unit.
Cliff Harper, c/o Mrs. Manning, 61 Fourth Cross Road, Twickenham, Middx. Constructing the most amazing comic book ever seen about a society based on alternative technologies.
Request: (Lost or stolen or strayed Dept.) If anyone knows how to contact Nick Holliman, the Hamlet of alternative technology, will they please let us know.

Meanwhile, in the USA:

John Todd, New Alchemy Institute East, PO Box 432, Woods Hole, Mass 02543, carefully develops technical variations on the spirit of old Kropotkin.
Lloyd Kahn, Shelter Publications, PO Box 279, Bolinas, Ca 94924, reflects on whiteman technology and finds it "smart but not wise".
George Lewis, c/o Mother Earth News, PO Box 38, Madison, Ohio 44057, is in charge of Mother's Research Centre.
Jack Jacques, 1158 Magnolia, Manhattan Beach, Ca 90266, seems to be part of a group calling itself "Technical Freeks" but we know no more than that.
The Aquarius Project, PO Box 4013, Berkeley, Ca 94704, seems to be doing some excellent things about the evolution of commune organisation.

And in Sweden:

Herman Donner, Box 35, Bergshamra 76010, worked with us on the People's Technology Exhibition and teaches at the Architectural High-school in Stockholm.
Per Janse, Vikingagatan 10, Stockholm 11342; alternative everything.

In Holland:

Roel van Duijn, Nieuwe Leliestraat 37, Amsterdam, is a Gnome for all seasons.
Sietz Leeflang, Dorpsstraat 7, Riethoven, N.B. is starting a "test-farm" backed by the local council, and produces a magazine of alternative technologies called De Kleine Aarde (The Small Earth).
Rinie van den Brand, Bosscheweg 67, Vught, is working with an Eindhoven group called "Schoon Dorp" (clean village) seeking the application of biotechnic methods at a village level.

In Germany:

Robert Jungk, Steingasse 31, A-5020 Saltzburg, Austria 6222, is doing a lot of writing about alternative technologies and is running a university programme on the subject in Berlin.

In France:

Phillipe Boitel, 46 Rue de Laborde 75008 Paris, has been working in Ethiopia with the Village Technology Innovation Experiment.
Yann Burlot, 35 Rue Mauconseil, Paris 75001. Amis de la Terre.
John & Maria Clemmow, 77 Rue Fondary, 75015 Paris, are running the Normandy branch of the BRAD project.

In Denmark:

Carl Herforth, Arkitekskolen, Oven Gaden N Vande 9, Chistianshavn, Copenhagen Another architect. The field is stiff with them.

We're not quite sure how wide the scope should be here. It seems to us that "alternative technology" fades off at one end into "alternative society", the periodical literature of which is covered by Martin Richards' directory, q.v.

On the "alternative science" end, there is a "mystical" school, exemplified by the Research into Lost Knowledge Organisation (RILKO), 36 College Court, Hammersmith, W.6.; and a political school, exemplified by the British Society for Social Responsibility in Science (BSSRS), 9 Poland Street, London, W.1., or Scientists and Engineers for Social and Political Action (SESPA), 9 Walden Street, Jamaica Plain, Mass. 02130, USA. These two schools have approximate counterparts on the "alternative society" end, the freaky counter-culture being approachable through the excellent information service run by BIT (141 Westbourne Park Road, London, W.11); the more self-consciously political through Agitprop (248 Bethnal Green Road, London, E.2.) or, for the literature, the 87-page bibliography to Counter-course: A Handbook for Course Criticism, Ed. Trevor Pateman, Penguin Education 1972.

On alternative technologies proper, extensive directories and bibliographies can be found in:

Survival Scrapbook Vol. 1: Shelter (SS1) and Vol. 2: Food (SS2) by Stefan Szczelkun, Unicorn Bookshop, 50 Gloucester Road, Brighton, Sussex;
"Designing for Survival" Ed. Colin Moorcraft, in Architectural Design Vol. 42 No. 7, July 1972 (ADDS): from Standard Catalogue Co. Ltd., 26 Bloomsbury Way, London, W.C.1.
The Last Whole Earth Catalog (LWEC), 558 Santa Cruz Avenue, Menlo Park, Ca. 94025;
The Mother Earth News (TMEN), PO Box 38, Madison, Ohio 44057, USA: any recent back numbers, but No. 16, July 1972 is very good value.

These are probably indispensable for sheer information not conveniently obtainable elsewhere. The Whole Earth Cat and Mother Earth News are somehow very American and often strike Europeans as rather commercial. Mother has just given birth to an urban baby called Life-style: see No. 16, address above.
Canadian Whole Earth Almanac (341 Bloor Street West, Box 6, Toronto 181, Ontario, Canada) specialises in cold-climate conditions. Other useful periodicals include Undercurrents itself (34 Cholmley Gardens, Aldred Road, London, N.W.6.), a very open-hearted creature; Architectural Design, a monthly that has all the latest in alternative gimmickry; The Ecologist (73 Kew Green, Richmond, Surrey) and Environment (438 N. Skinner Boulevard, St. Louis, Mo. 63130, USA), both of which periodically contain articles about alternatives. A number of irregular magazines have appeared recently which combine whimsy, enchanting graphics and a kind of misty bioanarchism: The New Alchemy Institute Bulletin (Box 432, Woods Hole, Mass. 02543, USA), pledged to "Restore the Lands, Protect the Seas, and Inform the Earth's Stewards"; Street Farmer (63 Patshull Road, London, N.W.5) and printed entirely in green; Country Bizarre (9 Danesmoor, Ruscote, Banbury, Oxon.) exactly that. See also Resurgence 275, King's Road, Kingston-on Thames, Surrey; and Towards Survival, 79, Sutton Avenue, Eastern Green, Coventry, Warwickshire.
There aren't many books specifically devoted to alternative technologies (see "philosophy" section below) but these may be nice to start on:

Living on the Earth by Alicia Bay Laurel (Vintage, 1969). Unashamed handwritten back-to-the-land romanticism;
Smart But Not Wise by Lloyd Kahn (Shelter Publications, PO Box 279, Bolinas, Ca. 94924, USA): by the doyen of Domes; subtitled "further thoughts on Domebook 2, Plastics, and Whiteman Technology" just 24 pages of very good sense;
Design for the Real World by Victor Papanek (Thames and Hudson, 1972), less obsessively rural than most of the material here, arguing against designing for profit; and the Architectural Journal will be bringing out an alternative technology supplement, probably in January 1973.

Ordinary D.I.Y. books which are very helpful are:

The Engineer's Illustrated Thesaurus Chemical Publishing Co., NY. 600 More Things to Make G.C. Cook and L.J. Phipps, (GWP)
The Engineer's Illustrated Thesaurus Chemical Publishing Co., NY.
600 More Things to Make G.C. Cook and L.J. Phipps, (GWP).
The Smallholder's Encyclopaedia, Ed. S.A. Maycock and John Hayhurst, C.A. Pearson, London 1950.
How to Fix Almost Everything by Stanley Schuler (GWP).
Henley's Twentieth Century Book of Ten Thousand Formulas, Processes and Trade Secrets, by T. O'Connor Sloane, Books Inc., N.W. Hemley Publishing Co., NY.
Formulas, Methods, Tips and Data for the Home and Workshop, by K.M. Swezey, Harper and Row, 1969
The Ways Things Work by C. van Amerogen, Paladin, 1972.

Many relevant books can be obtained by mail order from various truck stores in the United States, and it may be worth writing for catalogues. They often sell many other things besides books. The Whole Earth Truck Store and Mother's Truck Store have addresses as for Whole Earth Cat and Mother Earth News; another good catalogue can be obtained from Garden Way Publications, Charlotte, Vermont 05445. (hereafter abbreviated as GWP). In Britain, the Select List of Books and Information Sources on Trades, Crafts and Small Industries in Rural Areas (CoSIRA, 35 Camp Road Wimbledon, London, S.W.19) is probably more accessible. For old books, the Science Museum Library *or the British Museum have some* quite amazing things. For government publications, see breakdown of of HMSO sectional catalogues in Survival Scrapbook or write to the Director of Publications (section P6c), HMSO, Atlantic House, Holborn Viaduct, London, E.C.1. For keeping an eye on the orthodox science and technology scene, New Scientist (128 Long Acre, London, W.C.2.) is hard to beat.

SPECIAL FIELDS

ENERGY

Most of the people mentioned in this section are interested in alternative energy sources in general, but are put under specific categories where they have particular interests or expertise. "Non-specialists" include Bynon, Eriksson, Harper, Leeflang, McKillop, Ryan, van den Brand (see above), and Don Marier (300 South Taylor Avenue, Oak Park, Illinois 60302, USA) who puts out a newsletter called Alternative Sources of Energy. The basic text is the 7-volume UN report New Sources of Energy (Sales No. 63/1/41, (1964) from HMSO etc.) which breaks down as follows: 1 General; 2-3 Geotermal; 4-6 Solar; 7 Wind. Most of the textbooks are rather old, and this is evident in any alternative energy bibliographies, such as that in the "Designing for Survival" issue of AD (see ADDS above) or the references in the UN volumes. We have not been able to get hold of Don Marier's newsletter, but it is said to contain good bibliographic material and may be much more up-to-date. Good introductions to the question of energy in general can be found in the Scientific American special issue of September 1971, or Man and Energy by A.R. Ubbelohde (Penguin 1969). Issue No. 2 of Undercurrents was about energy and contained some useful stuff.

WIND

This is becoming something of a rage. For an extensive bibliography contact David Stabb (10 Dynevor Road, Richmond, Surrey) who, as well as making bibliographies is doing a lot of very unorthodox things with the wind. Others specifically interested are Mike Brooks (Kingston

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Polytechnic, Kingston-on-Thames, Surrey); Rune Jönsson (Eskadervägen 30, Täby, Sweden) who is Mr. Wind in Sweden; Sietz Leefland (see above) who with some engineering colleagues is studying especially the problems of low-speed mills made largely of bicycle parts; Kit Pedler (see above) whose fibre-glass Hütter mill in Clapham was recently killed in action during a storm; Rinie van den Brand (see above); and Peter Harper and Chris Ryan, who are trying to design simple windmills for use on Swedish summer-house sites. For lovers of the antique, the windmill society "De Hollandse Molen" (Reguliersgracht 9, Amsterdam) bears the standard bravely in Holland. Groups affiliated to this society are attempting to adapt old mills to new uses such as electricity generation (W.D. Eelman, N.V. Texelsche Electriciteits-Maatschappij, Texel, Oudeschild) or to revive the noble craft of milling (E. Zwijnenberg, Het Gilde van Vrijwillige Molenaars, Herengracht 75b, Amsterdam). Research on wind power in Britain was formerly carried out by the Electric and Allied Industries Research Association, but this was all stopped, and much of the material has been transferred to the University of Reading (contact Bob Congdon, see above). In the United States, a group called Humble Pie (Box 27, Berkeley 94701) has been noticed making windy noises, but we have not followed this up yet.

Basic texts on wind are E.W. Golding's The Generation of Electricity by Wind Power (Spon, 1955), a very fine book but now difficult to get hold of; and Power from the Wind by P.C. Putnam (van Nostrand, 1948), as well as Volume 7 of the UN New Sources (see above). Solar and Aeolian Energy, edited by A.G. Spanides and A.D. H Hatzikakides (Plenum Press, 1964) is also a report of conference proceedings. Most of the rest of the literature is in the form of technical reports or has more an antiquarian than an engineering interest. Many of the E.R.A. reports can be seen in the Science Museum Library, covering a wide range of possible applications, such as the generation of hydrogen by wind power for purposes of energy storage (see David Stabb's bibliography). Details for the construction of a simple wind motor based on a car generator are obtainable in the Lejay Manual, Lejay Manufacturing Co., Belle Plaine, Minn. 56011, USA, or dramatically condensed in Mother Earth News No. 6. For loving descriptions, with technics, of old mills, Rex Wailes' The English Windmill (Routledge, 1954) is excellent, as is Windmills and Watermills, by J. Reynolds (Praeger, 1970), but the ultimate collector's piece must be the Transactions of the Second International Symposium on Molinology (available from Selskabet Danske Møllers Venner, Brede, Lyngby, Denmark) amazing.

WATER POWER

The last-cited volume also contains historical material about small-scale water power, including some correspondence with the British Government about the effects of the 1963 Water Resources Act, which affects the economics of many still-operating watermills. Reynolds' book (see above) deals with mainly American material, while Discovering Watermills by J.T. Vince (Shire, 1970) is a very concise motorist's guide to British watermills (some irony here?) Leslie Syson's British Water-Mills (Batsford, 1965) is a more substantial treatment of the same topic. On the technical side, the textbook is J.G. Brown's Hydro-electric Engineering Practice (3 Vols., Blackie, 1958), while Power from Water, by T.A.L. Paton and J.S. Brown (Leonard Hill, 1961) is more popular. Issues No. 13 and 14 of the Mother Earth News contained reprints of a now classic series of articles from Popular Science magazine outlining the basic principles of small-scale water power. The James Leffel Co. (Springfield, Ohio, USA) produces a number of helpful pamphlets including details of available equipment. In England the main suppliers are G. Gilkes and Gordon Ltd., Craven House, Kingsway, London, W.C.2. Discussion of tidal power can be found in Tidal Power by T.J. Gray and O.K. Gashus (Plenum Press, 1972). Other references on water power can be found the special issue of AD (see above).

SUN POWER

The basic references here are Volumes 4-6 of the UN New Sources report, and Direct Use of the Sun's Energy by Farrington Daniels (Yale, 1964). These, and ADDS, will give guides to further material. As with wind, a lot of the literature is old (as technical things go). The Directory of World Activities and Bibliography of Significant Literature produced by the Association for Applied Solar Energy, Tempe, Arizona in 1959 would be very useful, but we've never seen it. The Association seems to have moved to Australia (PO Box 52, Parkville, Melbourne, Victoria) and puts out a journal called Solar Energy, sample copies of which can be obtained from Pergamon Press (Headington Hill Hall, Oxford OX 3 OBW). We have been given another Australian address, to wit N. Robinson, CSIRO Division of Building Research, Graham Road, Highett, Victoria 3190, but we only know that they are doing "something solar" - perhaps cooling. Practical aspects of building for solar energy can be found in Your Solar House, edited by M.J. Simon (Simon and Schuster, 1947); "Sunshine Power" by Everett Carlson, Jr., in Mother Earth News No. 9, in which is recommended "Solar House Models" by Harry E. Thomason (Edmund Scientific Co., 101 E. Gloucester Pike, Barrington, N.J. 08007, USA - $1.00); and Ken Kern's The Owner-Built Home, of which anon. For extensive details on solar house design, and for further leads to who's doing what, contact John Frazer, Autonomous Servicing Group, Department of Architecture, University of Cambridge). For the eccentric colar collectors' department, Robin Dunipace, Architectural Association, 34 Bedford Square, London, W.C.1.

METHANE

The most famous proponent of producing and using methane from animal wastes is the chicken-farmer Harold Bate (Pennyrowden, Blackawton, Totnes, Devon) who produces special devices for converting petrol engines to propane or methane. Details of this procedure can be obtained from Bate himself, from BLUP (see above) or from Beau Geste Press, Langford Court 8, Cullompton, Devon. An extensive critique of Bate's method is presented by Jerry Friedberg in Mother Earth News No. 15, and alternatives are presented in some detail although the photographs accompanying the article have been reduced a bit too much for comfortable interpretation and it would be best to contact Jerry Friedberg directly (Arrakis Volksvagen Box 531, Point Arena, Ca. 95468, USA). For the methane generating side, there are a number of articles containg essentially the same information: the last Undercurrents; Keith D. Gilbert's "How to Generate Power from Garbage", in Mother Earth News No. 3; the Beau Geste Press "Manifesto Pamphlet Sitting Dog & Co" (rather nice this, a packet of five A4 cards, practics on one side and some lyrical philosophy on the other). Descriptions of medium-scale methane projects in India can be obtained from Ram Bux Singh, Gobar Gas Research Station, Ajitmal, Etawah (U.P.) India in a set of two booklets Bio-Gas Plant and Experiments with Bio-Gas (£2). These are summarised in Mother Earth News No. 12. Two main contacts in Britain are Bob Congdon and Andy McKillop, (see above) who are trying to collate all the available information on methane generation. The last we heard from Sietz Leeflang in Holland he was demonstrating the potentialities of his pig/human brew-up to a television audience.

HEAT-PUMPS

Heat-pumps are usually used in conjunction with solar heating. Driving heat-pumps may well turn out to be an efficient use of small windmills, and indeed a British patent has been granted to a wind-powered heat-pump system. References in the AD special issue are not given in enough detail to be easily followed up, and better bibliographic guides are available from Dave Parham, Architecture Association, 34 Bedford Square, London, W.C.1.; or Ken Yeang, Department of Architecture, University of Cambridge. In connection with heat-pumps, the recently-revived Stirling engine may turn out to hold a lot of interest, as it can operate in three modes: as a motor, as a refrigerator, and as a heat-pump. For material on Stirling engines, contact Intermediate Technology Development Group Ltd., 9 King Street, London, W.C.2.; or Dr. R.J. Meijer, Philips Research Laboratories, Eindhoven, The Netherlands.

BUILDING

The standard "alternative" housing unit for about a decade has been the dome, constructed from geodesic units à la Buckminster Fuller. The basic dome text is Domebook 2 (Shelter Publications, Box 279, Bolinas, Ca. 94924; or available from AD office, 26 Bloomsbury Way, London, W.C.1.). For someone in Britain who knows about domes, contact John Ewald, 13 Byam Street, London, S.W.6., or John Fagg, 35 St. Augustine's Road, London, N.W.1.

But perhaps domes have now reached the end of their symbolic phase, and can now take their place among a much wider range of alternatives. Lloyd Kahn, editor of Domebook 2, sums up his reflections of many years dome-building in the booklet Smart but not Wise (see above). The best guide to this wider approach is Szczelkun's Survival Scrapbook Vol.1: Shelter (see above), which has a superb bibliography apart from all the practical information it contains. The catalogue of the Building Research Station, Garston, Watford, Herts., is also recommended. For self-build housing, the textbook is The Owner-Built Home, by Ken Kern (Sierra Route, Oakhurst, Ca 93644, USA) serialised in Mother Earth News from No. 5 on. See also Low-Cost Housing for Rural America - A Construction Manual (Superintendent of Publications, US Government Printing Office, Washington, D.C., 1969) or if it can found, Ronald Duncan's Home-Made Home (Faber, 1947). We haven't seen Outlaw Building News (Star Route, Point Reyes Station, Ca 94956, USA), but it has been recommended.

As with many other aspects of alternative technology, there are "traditional/revivalist" and "futuristic" approaches to alternatives in building, although they are not necessarily antagonistic. Something of a synthesis on the level of theory has been achieved by Paul Oliver in his Shelter and Society (Cresset Press, 1969). Arguably the Prince of futurists is Buckminster Fuller, and the 6 volumes of the World Design Science Decade (University of Southern Illinois, Carbondale, Illinois, USA) could be extremely useful for builders in a rarified sort of way. A number of groups are attempting to design and build "autonomously serviced" houses which maintain themselves without external imputs apart from initial construction. Some idea of the work going on in Cambridge can be gained from ADDS; more details, and bibliographic material from John Frazer or Ken Yeang, Dept. of Architecture, Trumpington Street, Cambridge. Similar work is being done by Mick Bedford (see above), Peter Bynon (vide supra), and Steve Szokolay, Polytechnic of Central London, Marylebone Road, London, N.W.1. See also "An Ecologically Sound Architecture is Possible", by Malcolm B. Wells, in ADDS.

For the traditional stuff, it's hard to get more traditional than Vitruvius's On Architecture (Harvard UP, 1955, republished by Dover). Another delightful book is The Country Gentleman's Architect, by R. Lugar, originally published in 1807, reprinted by Gregg International Publishers, Westmead, Farnborough, Hants., 1971. Bernard Rudovsky's Architecture Without Architects (Doubleday, 1964) is deservedly well-known. R.W. Brunskill's Illustrated Handbook of Vernacular Architecture (Universe Books) is warmly recommended by Lloyd Kahn. For traditional building materials, the ADDS bibliography is good. On earth and soil-cement, there is a bibliography in the fall 1970 Whole Earth Catalog, and SS 1 has a good section on this, with plenty of references. The most widely-cited sources are Building in Cob, Pise and Stabilised Earth by Clough Williams Ellis and J. & E. Eastwick-Field (Country Life, 1919, 3rd Ed. 1947 - still commonly found in second-hand bookshops); Soil-Cement: Its Use in Building (United Nations, 1964); Handbook for Building Homes of Earth (US Government Printing Office, Publications PB 179327). On the use of stone, E.G. Warland's Constructional Masonry (Pitman, 1947) and Modern Practical Masonry (Pitman, 1953), F. Rainsford-Hannay's Dry Stone Walling (Faber, 1957), and for cross-cultural comparison, Stone Shelters, by Edward Allen (MIT Press, 1966). For wood construction, again see SS 1, and Use of Home-Grown Softwood in House-Construction (Forestry Commission, HMSO 1959); Timber-Building for the Country, edited by E.H.B. Boulton (Country Life, 1939); Building a Log House (University of Alaska Cooperative Extension Service, Box 1109, Juno, Alaska 99801, USA); HMSO sectional catalogues Nos. 3 and 31; and (in France) Centre Technique du Bois, Avenue de Saint-Mande, Paris 75012). References on other traditional materials such as thatch, bamboo, slate, tile and rush, as well as on bricks and concrete, can all be found in SS1 and ADDS. Building with scrap and scavenged materials is a principle with animates Graham Caine's eco-house (see above). He has also submitted designs for houses which are grown rather than built, based on the giant Malayan bamboo. The bamboos even arrived from Singapore, but unfortunately died during quarantine at Kew Gardens. Those whom the gods love...we're not quite sure how to read this omen. For use of scavenged material on a fair scale, see Drop City by Peter Rabbit (Olympia Press, 1971).

FOOD

The basic references are: Survival Scrapbook No. 2: Food, (SS 2) by Stefan Szczelkun (Unicorn Bookshop, 50 Gloucester Road, Brighton), which also covers water, air and waste treatment; Garden Way Publications catalogue (see above); Blackwell's catalogue of British farming books (No. 894), Blackwells, Broad Street, Oxford; HMSO Sectional Catalogue No. 1, Agriculture and Food; The Encyclopaedia of Organic Gardening by J.I. Rodale (Rodale Press, Chestnut Close, Potton End, Berkhamstead, Herts.) - Rodale press publishes a great deal of material on organic gardening, mostly American - catalogue on request. Organic Gardening and Farming is also published by Rodale (American edition somewhat different from 33 E. Minor Street, Emmaus, Pennsylvania 18049, USA).

Two very famous historical books on the "organic method" are Sir Arthur Howard's An Agricultural Testament (Oxford, 1940) and F.H. King's Farmers of Forty Centuries (1911). After this the quantity of literature is enormous and we can only suggest a few titbits. Frances Lappe's Diet for a Small Planet (Ballantine, 1971) is a concise and practical argument for using less meat. R.W. Langer's Grow It! (Saturday Review Press, 1972) has been getting rave notices in Mother Earth News, who plan to serialise it over the next couple of years. B. Kaysings' First-Time Farmer's Guide (Straight Arrow, 1971) looks interesting though we haven't seen it. On composting, Rodale produce a magazine called Compost Science; Thomas J. Barrett's Harnessing the Earthworm (Faber, 1949) sound like something from a Midsummer Night's Dream; otherwise contact Colin Moorcraft (see above) who is very much into worms, or Lawrence D. Hills of the Henry Doubleday Research Association, 20 Convent Lane, Bocking, Braintree, Essex. On non-chemical pest control, "Pacifism in Pest Control" "Pacifism in Pest Control" by Charles F. Jenkins, Mother Earth News No. 9; Gardening Without Poisons by Beatrice Trum Hunter (Britnell's, Toronto 1964); and The Bug Book: Harmless Insect Controls by John and Helen Philbrick (GWP); and Companion Plants and How to Use Them, by Helen Philbrick and Richard Gregg (also GWP). On cooking and preserving, SS 2; "How to Preserve Produce Without Refrigerators" by Frank Garrett (TMEN No. 9) describes a method for sprouting in a manner which is a model of demystified "people's technology". On Hydroponics, the best guide is Beginner's Guide to Hydroponics, by J. Sholto Douglas (Pelham, 1972), or Profitable Growing Without Soil by H.F. Hollis (English Universities Press, 1964); for someone with practical experience of indoor hydroponics, contact Graham Bamboo Caine (see above). For normal types of livestock rearing, see the GWP Catalogue, SS 2, or The Smallholder's Encyclopaedia (see above). For fish as an alternative protein source, C.F. Hickling Fish Culture (Faber, 1962) and contact the aquaculturist John Todd (see above). For non-animal sources of protein, practical works are The Complete Bean Book by Victor Bennett (GWP) and The Soy Bean Cookbook, by Dorothea van Gundy Jones (General Publishing Company, 30 Lesmill Road, Don Mills, Ontario, Canada); while more technical treatises are Legumes in Human Nutrition (FAO, 1964) and R.S. Mackley's Soy Beans and Soy Bean Products (Wiley Interscience, 1950). For scavenging and collecting wild things, Survival Scrapbook 2 is quite outstanding. Euell Gibbons's books, Stalking the Wild Asparagus, Stalking the Blue-Eyed Scallop, and Stalking the Healthful Herbs (Mother's Truck Store) are undoubtedly the best-known wild food books.

Other food contacts: The Horticultural Society Library, Royal Horticultural Society, Vincent Square, London, S.W.1.; The Beekeepers' Association, 55 Chipstead Lane, Riverhead, Sevenoaks, Kent; The Glass House Crops Research Institute, Rustington, Littlehampton, Sussex; The Rudolph Steiner House, 35 Park Road,,London, N.W.1.

CLOTHING AND TEXTILES

The best source of material on weaving and dyeing in Britain is K.R. Drummond, 30 Hart Grove, Ealing Common, London, W5 3 NB. The catalogue, available on request, contains 84 titles on dyeing and 76 on weaving and rugmaking, including foreign titles, many from Scandinavian countries where handweaving and dyeing is still very much alive (in Sweden, contact Svenska Hemslöjdföreningarnas Riksförbund). In Britain, the relevant craft society is the Guild of Spinners, Weavers and Dyers, Hon. Sec. W.H. George, 57 Hartley Down, Purley, Surrey CR2 4EF, which publishes the Quarterly Journal of the G.S.W.D., edited by Ruth Hurley, 47 East Street, Saffron Walden, Essex. In the United States, the main journal is the Handweaver and Craftsman (10 McGovern Avenue, Lancaster, Pa., USA). Other leads can be found in Canadian Whole Earth Almanac Spring 1971; LWEC; and sundry Mother Earth Newses. On growing fibre crops (which are often also oil crops, we have not found anything in English yet. If you read Swedish, why not try Odling av Olje- och Spanadsväxter, by Gösta Andersson & Ingvar Granhall (LT's Förlag, 1954). On shoemaking, see Manual of Shoemaking, edited by Jane Clarke (Clarks 1966).

WATER TREATMENT

This topic tends to get covered under other headings such as methane production or composting. Ideally there should be no "waste" as every product has a natural place in ecological cycles. Sound uses should be sought for by-products of manufacturing processes, as is done in China. SS 2 has a good section on waste treatment. Also see the article on building privies in TMEN No. 14; Excreta Disposal for Rural Areas and Small Communities by E.G. Wagner and J.N. Lanoix (WHO, 1958 - HMSO); Composting by H.B. Gotaas (WHO, 1956, Monograph Series No. 31). For information about the "multrum" composter developed in Sweden, contact Carl Lindstrom, Kammakargatan 44, 111 60 Stockholm, who makes them.

MEDICINE

We have not looked into this very thoroughly, so the leads here are even more perfunctory than the rest. What is alternative medicine anyway? John Powles (Centre for Social Research, University of Sussex, Brighton) wrote a paper for the Alternative Technologies meeting in February 1972 called "'Engineering' and 'Ecological' Approaches to Medicine", the implication which was that social rather than technological variables are the essence of alternative medicine (something which, in the classical left-wing view, is true of all "alternative technologies"). Medicine is strong magic in our cultures and we hesitate to launch off into references to acupuncture, herbals, hypnosis and other tabooed folk cures. Anyway, try contacting John Powles, see SS2, A Traveller's Guide to Health, by James M. Adams (Sphere 1968) (straight) and Culpeper's Complete Herbal (Foulsham, n.d., reprint) (not so straight), and look through a few numbers of Country Bizarre.

TRANSPORT

This is another area we've hardly begun to think about, and again it's probably more a social than a technical matter. Most attention has been paid to smoothing some of the rougher corners of conventional transport machines, such as their output of pollutants. The BLUP pamphlet "Immediate petrochemical alternatives" (113 Warwick Avenue, London W.9.) discusses the matter very competently, and details of engine conversions can be found either in this pamphlet or in Jerry Friedberg's article in Mother Earth News No 15, discussed above under methane. Steve Boulter, Foundation for Environmental Improvement, Burgate Ho., Hascombe, Surrey, has actually constructed a steam-powered automobile, and would be happy to give advice on the matter. In Sweden, Varis Bokalders, Örnstigen 27, Täby, converted a 1940's Volvo bus to propane for alternative tours round the seamy side of swinging Stockholm. More radical rearrangements of transport (dirigibles, canals, souped up sailing ships) are under consideration (see e.g. "The Return of the Airship" by Basil Clarke, The Ecologist 1 (4) (1970)), but the priority is to ask why so much and so many must go so far, so fast, so frequently; and what alternative technologies can contribute to lessening these growing demands for transport. (Stop Press: Country Bizarre No 8 has a characteristically delicate bicycle supplement).

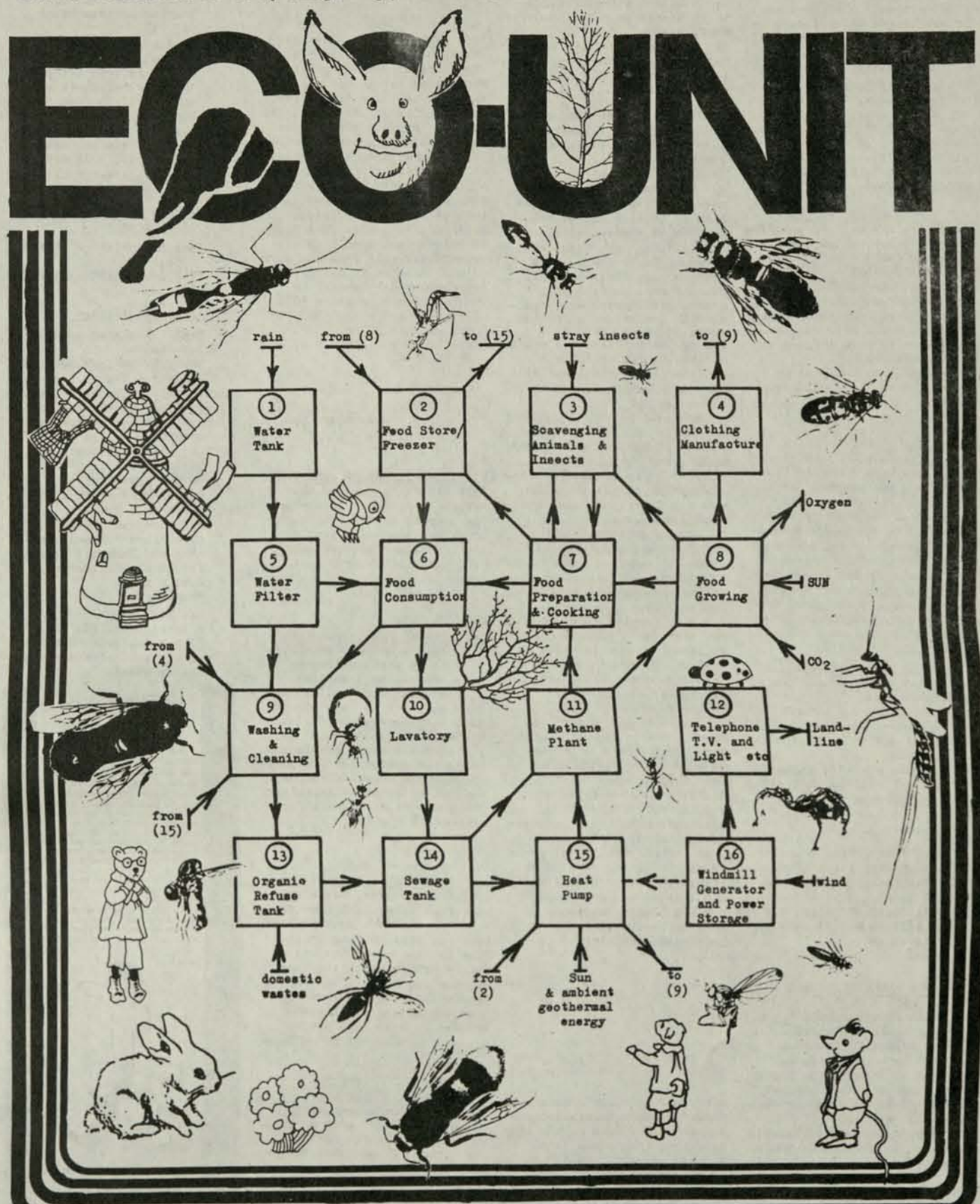
THIRD WORLD

A number of individuals and groups are investigating the application of alternative technologies in Third World conditions. In Britain, the Intermediate Technology Development Group is outstanding (9 King Street, London W.C.2). E.F. Schumacher, who founded the Group, has summarised the philosophy of intermediate technology in a number of articles, such as "Buddhist Economics" (Resurgence, 1, 11 (1968) and "The Economics of Permanence" (Resurgence Vol 3 No 1, 1970).

ITDG publishes a number of useful pamphlets such as Tools for Progress. In North America: Volunteers for International Technical Assistance (International Division, VITA, College Campus, Schenectady, NY 12308, USA), which publishes The Village Technology Handbook; and the Brace Research Institute (McGill University, McDonald College, St Anne de Bellevue, 800 Quebec, Canada). A paper by Stanislaw Wojtaszek, Alternative Models for Development (Science Division, Unesco, Place de Fontenoy, Paris 75007, France) discusses the merits of the "utopian" model of development, which includes variations on the alternative technology theme. In the Third World proper, John Morgan's Village Technology Innovation Experiment (PO Box 31, Goat Hill, Addis Ababa, Ethiopia) has produced its first giant fact sheet; John Burnham (Rucom Industries Ltd, Longolongo Street, P.O. Box 800, Lusaka, Zambia) visited the exhibition in Stockholm and would be interested to exchange ideas with others interested in rural development; for discussion of the political theory that might be appropriate to developmental technology, see Julius Nyerere's Ujamaa, Essays on Socialism (Oxford U.P., 1967). In India, proceedings of a conference on Appropriate Technology for Economic Growth can be obtained from the Appropriate Technology Cell, Ministry of Industrial Development, New Delhi, India. Wojtaszek mentions in his paper the Amarpurkashi Village Project, PO Bilari, District Moradabad, U.P., India, but we don't know any details. Josefina Mena, a Mexican architect (c/o Mrs Cuaik, 354 La Fontaine, Col. Polanco, Mexico 11 DF, Mexico) has recently completed a brief for low-cost self-build housing in Santiago de Chile. A book which catalogues some difficulties of applying conventional technologies to Third World development is The Careless Technology: Ecology and International Development, edited by M. Taghi Farvar and John P. Milton (Natural History Press, Doubleday, 1972). Some alternatives to "careless technology" (whatever they are) are being examined by a group of young scientists from Third World countries called the "Oi Committee" (contact Taghi Farvar, Center for the Biology of Natural Systems, Washington University, St Louis, Missouri 63130, USA; or Deepak Bajracharya, 8/485 Otu Mubahal, Kathmandu, Nepal). Over all this stands the astonishing example of China, who while not very warm towards many of the technological principles that interest us, seems to be evolving a completely new way of organising production, and seems to us to be articulating very well the spirit of what we are trying to do. Some aspects of this organisation are discussed in "The Chinese Model: Some Characteristics of Maoist Policies for Social Change & Economic Growth" (in Socialist Economics, Ed Alec Nove and D.M. Nuti, Penguin 1972); "Capitalist and Maoist Economic Development", by John Gurley, in America's Asia, edited by E. Friedman & M. Selden (Pantheon, 1971) and "Rural Industrialisation in China" by Jon Sigurdsson (Science Policy →

IN THE LAST issue of UNDERCURRENTS, our "Eddies" section carried an item on three Manchester architects, John Wood, Tony Eastman and Murray Carden, who were looking for help in their attempt to draw up plans for a "closed life-support garden" capable of supplying the nutritional needs of a small family. Their research has led them to the proposal described here and sent to us by John Wood, who can be contacted at 899, Kingsway, Manchester M20 0PB.

ECO-UNIT



UNDERCURRENTS/3

(1) WATER TANK - anything from traditional wooden barrel to re-inforced tea-chest lined with polythene. Your own idea is probably the best one.

(2) FOOD-STORE/FREEZER - this could be part of a carefully designed heat-pump (see 15) which would transfer heat from the food-store to other parts of the system such as heaters.
Alternatives to refri geration (on practical or aesthetic grounds) include the rural skills of drying (peas etc.) salting (meat and fish), and bottling (fruits and veg.)

(3) SCAVENGING ANIMALS and INSECTS - lots of possibilities here :
a) Rabbits make very good protein as meat. Suitable varieties include English, Japanese, Himalayan, Belgium and Flemish Giant, Blue Imperial, Polish, Havanna Lop and New Zealand White. Hutches should be strongly built of wood and chicken wire or waterproofed mud, plaster or papier-maché etc. Give rabbit 3' x 2'6" floor space and get unit clear of ground-level. Keep well ventilated and out of strong sunlight. Bedding of sand, sawdust, or dried leaves should be kept clean. Plenty of clean, fresh water. For breeding details, see Farmers Weekly June 9th 1971 p.52.
It is also possible to grow grass hydroponically (see 8) on a seven-day cycle!
(J.Sholto Douglas)
b) Giant Carp - could be used in ponds or tanks (?) to clean up organic pollution & to provide first-class food.
(J.A.Gordon)
c) Free Range Pigs - very thorough feeders on domestic food surplus and residues. Bit ambitious for flat-dweller
(Emlen Littel)
d) Guinea Pigs - also good

(Prof. S.C.Harland)
e) Hens and Goats - value of goats questioned by other experts. (N.W.Pirie) •
f) House Flies - can be used to re-cycle chicken manure. Presumably they feed on the droppings and are eaten by hens and other small creatures (Prof. S.C.Harland)
g) Microbes and algae - can be encouraged to produce a food cycle for herbivors such as rabbits(see 8f)
i) Black Water Fly - used in Africa for animal and human protein source. (J.A.Gordon)
j) Evolve your own insect farm to help in a food-chain. Attract them at night with lights (Ultra-violet best) and trap with help of friendly spiders or nets, etc.

(4) CLOTHING MANUFACTURE -
a) Sheep's Wool ; if you keep sheep, this would be perfect. (Beata Bishop)
b) Nettle Fibre - (Prof. C.S.Harland)
c) Fibrous material left over from leaf-protein masher (see 8d) could be woven and waterproofed with linseed oil (Dr. E.C.Kirby)
d) Flax - can be grown in this climate and needs only retting before removal of the fibre. (J.Sholto Douglas)

(5) WATER FILTER - boxes or tubes filled with sand etc. Nylon/Terylene conical filters have been recommended for the efficient removal of most impurities. Biggest problem seems to be the heavy metals in urban rainwater, especially lead from petrol exhausts:- remedies include Reverse Osmosis (squeezing water through semi-permeable membranes)and filter beds of crushed glass. (Dr. E.C.Kirby)

(6) FOOD CONSUMPTION - important to make best use of available diet.
a) Eat little and often
b) Don't eat like a pig
c) Don't eat while worried or uptight
d) Combine a little unfamiliar food with usual diet and increase gradually.
e) If toothless; get good choppers.

(Adapted freely from a paper by Hilda Cherry Hills of the Henry Doubleday Research Assn)
f) Eat nothing that will not rot, spoil or decay, but be sure to eat it before it does so. (Prof. E.V.McCollum)

(7) FOOD PREPARATION AND COOKING -
a) Wash or spray food rapidly with water to conserve the vitamins (soaking removes)
b) Eat as many fruits and vegetables uncooked as possible.They provide cancer-protecting Catalase which is destroyed by cooking.
c) Store fats and perishable food in cool, closed containers or fridge
d) Steam vegetables or drop in minimum of boiling water; cook rapidly with lid on
e) Scrub roots well (mineral content mainly in skin), rather than peeling, prepare all food just before cooking , and salads just before you eat.
f) Cook any frozen food whilst still frozen.
g) Keep all vegetable water to add to the food (gravy or soup etc.)
h) Don't use soda with greens
i) Don't stir air into foods while cooking, or sieve or liquidise till cool.
f) Don't overcook

(8) FOOD GROWING -
a) Soya Beans are high protein vegetable "grow them and eat them" (Magnus Pyke)but don't seem to grow unaided in this country although Dr.Kennington is working on a suitable variety. (Prof. C.S.Harland)
b) Sunflowers are reckoned to be almost as nutritious by Prof. Harland
c) Hydroponics - very simple method of soilless gardening; liquid nutrients can be made up from chemicals or derived from processed sewage. Growth and nutritional value is reputed to be better than soil-grown produce. (J.Sholto Douglas)
d) Leaf Protein extraction possible with mechanical (or hand ?) pulping and heating machine to produce edible curd (It has been found that fibrous, leafy crops which are normally fed to animals contain more protein than others more tender and popular with humans) Main problem seems to be in overcoming our prejudice for novel tastes. We need to get scientists collaborating creatively with Fanny Craddock or inventive amateur cooks.
e) Research now being carried out on the amino acid (protein) balance of Haricot and Butter Beans grown in this climate. (Dr.Fred Wokes of the Vegetarian Society in collaboration with the Henry Doubleday Research Association)
f) Single Cell Protein - microbial and algae foods; these can be grown in conjunction with grass roots (as host) to increase protein content to 40% for human consumption. Can also provide balanced diet for herbivors. (J.A.Gordon) In Japan, Chlorella algae is used for food and grown in polythene tubes which are strung across rooftops. (Colin Moorcraft)
g) Large Edible Fungi - be careful not to eat poisonous varieties. Expert knowledge needed for identification. (Dr.E.C.Kirby)
h) Herbs - too many to list here. Useful for medicinal and important nutritional purposes. (Beata Bishop)
i) Biological Control of pests - much useful and vital info on this and other ecologically wise techniques from Lawrence D. Hills (Henry Doubleday Research Association)The Soil Association and the Rodale Press.

(9) WASHING AND CLEANING -
a) Fog-Gun - atomises warm water and solvents with air under pressure.Compressed air on surface of skin can be very dangerous (can cause lethal bubbles of air in blood).But if set up correctly, this system can give 'baths' of up to an hour using only one pint of water which is by this time evaporated. (R.Buckminster Fuller)
b) Ultrasonic Washing Machine - normally a complicated device with numerous electronic parts (vibrates clothes under water at frequency higher than sound). Would it be possible to construct a fluidic version with no moving parts except a hand-powered pump ? Suggested frequency 80 kHz/sec at 50 - 150 watts.A real luxury, but an ecologically sound consumer product.

(10) LAVATORY - Graham Caine has a two-pint water squirter in his Eco-House design, to flush and to keep paper out of the system (combined flusher and bidet). See Observer 27th August 1972

(11) METHANE PLANT - the gas (Same as N.Sea gas) is the result of de-composing algae working on sewage and organic waste.In addition to gas for cooking, Carbon Dioxide can be used in the food growing section to enhance growth.Hydrogen Sulphide may also be present, which may provide sulphur for organic insecticide solution. Methane may also be used in (slightly modified) petrol engines(information from Harold Bates). Estimated 15kW of power available from one acre of sunlit algae.In our climate temperature may have to be cunningly kept to above 50°F or preferably up to 95°F. (Colin Moorcraft) (John T. Nye)

(12) TELEPHONE, T.V. & LIGHTS -or whatever turns you on

(13) DOMESTIC WASTE TANK - this is really part of the sewage-to-methane process and the organic matter eventually provides liquid nutriant for the hydroponic process (see 8) or dry fertiliser for soil-grown plants.

(14) SEWAGE TANK - as with the Organic Refuse Tank (13) this is an aerobic process like composting.A separate compost heap surrounding the tank may help to maintain the required temperature.Unlike the Methane Plant, which needs a sealed vessel to maintain anaerobic action and gas pressure, only a weighted composting lid is strictly necessary. (This may be inadequate for reasons of hygiene)

(15) HEAT PUMP - basically a fridge in reverse; transfers heat from large land-mass or water volume to a much smaller location thus raising temperature in that spot. Demands fairly extensive piping under surrounding terrain and may be ineffective in this country. I am contacting an inventor who has patents on a system claimed to work in our climate

(16) WINDMILL GENERATOR & POWER STORAGE - good field for the mechanically minded; ex Government or Car-surplus dynamo etc. with old batteries if available.Better bet from conservation of metal standpoint is mechanical store of energy such as a weight on a winch which can be allowed to drop to turn the dynamo. (Dr. Kit Pedler)
Similar principle used can be used with water (windmill)pumped from lower tank or pond to large upper tank; as it flows back it turns turbine and generator. Other alternatives include hydrolysis of water (electrical separation of hydrogen and oxygen)the stored gases can be re-united in a fuel cell to produce an electric potential. (Colin Moorcraft)

READ ON

For More Detailed Information Read:-

i) "Beginner's Guide to Hydroponics" by J.Sholto Douglas. Pelham Books (£2.25)
ii) "Food Resources Conventional and Novel" by N.W. Pirie. Pelican (25p)
iii) "Survival Scrapbook/s 1,2, and 3" (£1.25 each plus 10p post) from Unicorn Bookshop, 50 Gloucester Rd. Brighton BN1 4AQ Sussex. tel 0273 682307
iv) "Last Whole Earth Catalog" from above address (?)

For Keeping up with World Eco News etc., Read:-

i) "New Scientist" - weekly (15p)
ii) "The Ecologist" - monthly (25p)

Useful Associations:-

i) Henry Doubleday Research Association
20, Convent Lane,Bocking
Braintree,Essex. (have kindly offered to send leaflet 'Basic Food Guide' free to any reader who sends stamped addressed envelope. Also complete list of other publications.
ii) Soil Association
Walnut Tree Manor
Haughley, Suffolk IP143RS
iii) The Rodale Press
Berkhamstead, Herts
(publishes "Organic Garden-ing and Farming" £2.10 for 12 monthly issues)
iv) Harold Bates
Pennyrowden
Blackawton
Totnes, Devon TQ4 7QN
(2 publications on methane at £1 each, also car conversion kits)

REVIEWS

AMRA ARMA

Hugh Routledge

ON A DOUBLE-DECKER podium high above the milling audience two sets of double drum kits are waiting for the action. Between them, a set of chimes fronted by a vibraharp. On the lower level, a mysterioso bank of digital input, with arrays of twinkling lights, hulked by Sound City amplifier stacks.
Across the platform from the computer cave, a cache of carefully-aligned tom-toms and bongos, and behind these a strung out assembly of conches and gongs.

This is the energy centre, August 15th, the International Carnival of Experimental Sound at the Roundhouse, London, at the start of the two hour set by Amra Arma.
Static builds thru' the crowd as a dark cowled figure glides thru' the ranks, mounts the steps to the podium and homes in on the computer banks.
Bare feet below the purple hem.
The glint of a copper vizor as he faces the terminal and sets in the jack plugs.
The magician Merlin in his solid-state crystal cave. The primeval electronic presentation is about to begin.
Amra Arma is a five-man percussion group from Sacramento, California. Fronted by Stanley Lunetta, the Wizard with an unorthodox line in electronics, the others, Ken, Jeff, Kurt and Karl, are build-your-own drum freaks and ex-pupils of Lunetta's.
The group has been together for over two years and has done outdoor concerts in parks and the occasional radio broadcast -- including one interesting experiment in trinaural sound: one stereo station and one mono, three channels. All of them have roots in rock and small group jazz, and an antipathy towards the straight eductional system -- though Stanley lays claim to a Masters degree signed by Ronald Reagan.

The audience has had a desultory evening so far, but now an expectant crescent closes in around the Sound City tower.
From 32 speakers relayed round the periphery of the Round House come the sinister twitterings of an electronic pulse. The audience skitters expectantly. The sixteen channel sound builds to a climax as phantasms -- dazzling gods in Eisenstein helmets and tattered feathers -- descend on to the double drum kits. And from the wings, which might be Atlantis, scuttles a scrawny, yellow-ochred, loinclothed gongbeater. In black leotards, fur boots, and cape topped with mutant speaker cabinet, comes the bass guitarist.
The Amra Arma sounds are assembled, the drums burst into power, Merlin's sleeves twitch as the rows of lights on the digital console catch fire.
Amra Amra's present musical development is concerned with an amalgam of primitive religious and modern technological ingluences. "Primeval forces and technological advances - a combination of science and energy". " The electronics consists of a sixteen channeled digital computer which Stanley and Karl built themselves. Stanley controls the digital though he is keen to stress the interaction that takes place during performance - "The drums control what the machine plays. Every time the drummer hits the drums the machine moves. Sixteen discrete lines of activity are changing by whatever one drummer does." The group take their name from a character in a mystical story by Robert E. Howard one of a group of 1930's occult authors (another being H.P. Lovecraft) whom they claim to be consderably influenced by. In some of Howard's stories there is a character called the Lion-Amra, which connects with the Lion in Hyborean - a barbarian age which existed long before Christ - "right up until the time Atlantis sank."

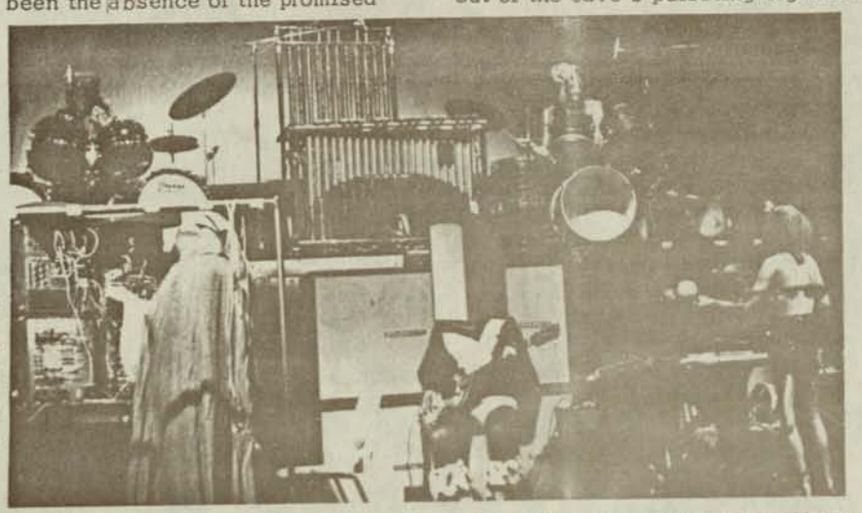
Lights change from red to green as the speakers shimmer out a strange syntax of tortured volts. Drum power pulls you back millenia, to before the Aztecs, as the electronic pulse from the speakers bends your head towards the extra sensory.

Amra Amra's performance technique relies heavily on a two way feedback system. Ken says of Stanley and his machine : "He can program or let it do whatever he wants and set up a thing which we have to follow. Yet we also have a lot of power on the drums to change direction too."Stanley takes up the theme; "what we play is based on the fact that we rehearse a lot, we have certain fixed things, what the pieces are about, certain visual signals, audible signals that are about what we are going to do."

The wizard cocks an ear to his digital box of sounds, tunes himself in to a stretch of drumming. Selects a lead from multiple channeled openings. Raises a finger to signal another shimmer.

Amra Amra got into the ICES festival through Stanley's own involvement with the international cross-media magazine SOURCE--he is one of the editors, along with Harvey Matusow, the festival organiser.
ICES is their first concert trip outside the USA, and they had considerable hassles getting here. "Our Volkswagen van blew up in Gilette, Wyoming, exactly halfway across the USA and 150 miles from the nearest VW dealer. We floated a loan and bought a Chevy. It goes up hill at 9mph and does 9 miles to the gallon, but it sure has a lot of room. At Toronto we almost missed our plane and when we landed at Prestwick the customs officer didn't have the list which would have gotten us thru', so we had to ride the train to London."
ICES has not turned out to be what any of them expected. They were told that accomodation and equipment would be laid on. In fact, although they have been staying with other ICES groups at University Village, a compound of prefabricated buildings in South London, they spent most of their two weeks in the UK going up and down the tubes collecting equipment.
All they brought with them was the digital gear; the drums, amplification

equipment, etc., were not available as as promised, and had to be collected. Stanley Lunetta sees this problem as inevitable with a festival of the scale of ICES -- trying to quartermaster the gear is often an insurmountable problem. More serious, though, in Amra Arma's collective view, has been the absence of the promised



Hugh Routledge.

audiences. Most nights the groups have been playing for themselves and a handful of new music freaks.
"It's a conference, really," says Ken Horton. " If I'd have known that I doubt very seriously that I'd have come. All this work, just so's we can masturbate."
Like all the ICES groups, Amra Arma came to England on a self-financing basis. They were told that they would share percentages from sales of cassette recordings and a film that was to have been made of the event. Now, they are not too sure that these projects are going to materialise.

A block buster of light and sound, synapses screeching, synapses screeching as the cross circuits pile up in the walls, like frantic swallows trying to escape, just above audible threshold.
Merlin controls the drums, operates the perceptual pulldowns with upraised fingers -- like sci-fi on invisible wires, an opening to the future thru' the past.
Of the other groups they have seen and heard at ICES, Lunetta had this to say: "I don't want to say that it's stuff that we did ten years ago, but we did. And so have a lot of other people, including those doing it here today. Charlotte Morom's ice cello, for instance, has been here a long time."
The group they dug the most was flykingen from Sweden, whose speaker relays and amplification system they had to borrow to play at all.
Concerning their own music, Amra claim that what they are doing is neither popular nor ultra avant-garde.
"We try not to turn anybody off. We appeal more to a progressive rock audience plus under-twelves. It's a fantasy trip, our sounds are very very pure . The only thing that could turn anyone off is the volume. Though we never play loud enough to get deaf."

Sounds ebb. Then it's as quiet as a mag tape storage room at IBM, nothing but the atmos' of good housewifery gathering the bare minimum of dust.
An interlude while Merlin and the mutant speaker head perform sepulchral surgery at the console, cutting out armfuls of jacks, draping them on a wheeled metal frame in silence, taking the cancerous bass out of the cave's pulsating organism.
Churchlike, too, a jackplug offertory performed by the master an initiate, until the sound, cleansed of the alchemy of elementals, strobes back with gathering velocity.
When they get back to Califonia, Amra Arma face an uncertain future. Their problem as a group is that they don't fit into any of the promoter's conventional categories.
They are currently working on two exposure trips: the university and college circuit, which has the disadvantage that they tend to get regarded as lecture material.
"Teachers bring in classes," Ken Horton explains. "They take notes, and get up and go when a bell rings. One time the audience kept changing. It was absurd, first it was full, than it was empty, then it was full again."
Also, going to the university for bread is distasteful. The world they dropped out of forces them to return as suppliants.
The other alternative is to hit the rock circuit, and right now there is a chance that Amra may get booked with Sun Ra.
Here the problem is different.
"Since we do a whole presentation which involves a lot of setting up we should be in the feature spot."
Stanley reckons that to get a touring show going in an extensive way they would need a squad of roadies roadies and that even then the logistic-al problems would be formidable.
There are other experimental groups on the West Coast, like the Audio Visula Ensemble, and the California Time Machine, but even if they shared equipment and resources with setups like these there would still be the difficulty of hooking-in large audiences Looks like the progressive rock circuit is the only way out for them.
Lights fix on red, bathing the Aztec god as he lays into his doublekit of drums. The Magician's vigilant fingers light-dance below. Plugs are slotted back. Layer on layer of sound-recycled variables --mount to a new aqua vitae. And Merlin grooves, hands outstretched to paratonal spirits . The cloak droops revealing white drapery and copper clamps around the cranium .....

On the technical and presentational side they have various projects to develop. Kurt is building a light machine which is directly related to the digital feedback system --" it would be structurally involved with the music. If a particular sound were not being heard at the time, it might be seen. A total environment, of giant floods, which will move a whole audience."
Stanley and Karl are working on a more complex version of the digital input at the same time. The machine will take in the sounds, reduce them to digital info and then reconstitute them.
"You could sing into a mike and it could sound like a whole choir," says Ken, " Or, like a tube train -- or Richard Nixon. Or, at the turn of a switch, you could make all the drums sound like plastic or metal or water," Stanley adds.

An usher whispers offstage. Amra Arma are overrunning. Yellow Ochre runs at his gongs, smashing into them as the bass holds off a shivering frenzy from the Aztecs.

Hugh Routledge

The ceremonial of crosscultures recedes, bays from a distance of huddled relays, floods fade and the astrals creep back timidly to the wings.
Suddenly, the magic is gone.

Mike Dorrell
Rick Witcombe
CENTRE-PERIPHERY MODELS

MOTORING GUARDIAN

IAN BREACH, motoring correspondent of the Guardian, resigned from the paper in June after failing to convince the editor that his job and his weekly column should be abandoned and replaced by coverage of transport in general.

A member of the Environmental Communicators" Organisation and of numerous transport and environmental reform groups, Breach has, in effect, been writing himself out of a job for the past 18 months. He was offered a reporter's job by News Editor Jean Stead, but turned it down on the grounds that he could not sit and watch someone else go through the same painful process and come up with the same answer.

Ian Breach writes

" The Guardian's coverage of motoring and the motor industry has traditionally been a mixture of the half-hearted and the sceptical. For years, the column was For years, the weekly column, For years, its weekly column -- started in 1952, was written largely by outside contributors, whose fey offerings were edited on a part-time basis by staffmen in the Manchester office. Even after the paper had moved most of its departmental headquarters to London, the motoring page was still done from Manchester: until the mid-60s, it survived on a diet of watery articles on vintage cars, overland journeys to the Middle East, and homespun advice on how to set tappet clearances. Whatever criticism could be made of it, though, it was never very interested in what the motor industry had to tell it, and under John Anderson's charge, it began to sound off on a number of serious topics and developed its crusade for safer cars.

John O'Callaghan, for a short time the Guardian's motoring correspondent, was the only one of a number of newsmen to refuse a BMC Mini, offered for road test but virtually being given away. After him came Adam Raphael, who concentrated his attentions on the Ministry of Transport and who campaigned long and hard for most of the provisions in Barbara Castle's Road Safety Act. Itook over from Raphael towards the end of 1969 and, for a while, continued to prosecute a similar case: safer cars, safer and better roads, higher standards of design and service, and so on. Essentially, though, the recipe was still a conservative one. We still received the latest models, still ate the lunches, and resisted only mildly what -- looking back -- have been wholly outrageous pressures from the motor industry. Not so much the "souvenirs" sent though the Christman post or left in hotel bedrooms but the continual lobbying for journalists' friendship -- a process nowhere more subtly cultivated .than when a manufacturer takes correspondents abroad to see his factory or drive his newest car.

IN 1970, two things decided me to make some changes. The first was Chrsler's £250,000 launch of the Avenger, an extravagant affair that took several hundred Journalists to Malta.

The second was the publication of Ehrlich's first book on resources.

Since then, the Guardian's motoring page has gradually turned into little more than a platform for my disapproval disenchantment with the car as a form of transport and bitterness at the way in which the industry props it up.

There were occasional murmurs of disapproval -- transmitted invariably through the paper's commercial departments -- but the editor, Alastair Hetherington, showed no sign that he found this critical trend unacceptable.

More significantly, readers have indicated that this was more important to them than to read chatty pieces about independent front suspension, how to drive to the Costa del Sol, and what to do when a front tyre bursts. Instead, their letters showed they were entering into the spirit of questioning and criticising. By the beginning of the year, it seemed that the time was ripe for a real change, and I suggested that the motoring page had come to the end of its natural life.

A brief note from the editor urged me to "calm down an maintain minimum common ground with our readers, many of who like their cars.

In June, I took the subject up with him at greater length and suggested that unless the motoring page gave way to a transport/environment page, it was -- if only in name and implication-- working actively against the environmental reforms we espoused so forcefully on other pages.

An offer was made to discuss my views, and, after aweeek I met the editor and explained at length what I believed should be done: that there should be a transport reporter instead of motoring correspondent, and that if a Monday column was to be retained, it could be refashioned.

It was my belief that we could show other papers the way, and that if we did not we would find ourselves lamely following one that did make this really rather small response to the pressures for change and reform. After making some vaguely concessionary noises, the editor indicated that there was no question of drastic change: it could be commercially damaging. Readers might desert us for the Daily Telegraph; certainly he could not accept that many young readers might actually respect us for acting on some of our own sermons.

I think he is wrong, and I have given up my job, after eight and a half years on the Guardian, to prove it. Working from the inside has its limits.

Free Communications Group

Pat Coyne, author of last issue's "Bomb" article, replies to Kit Pedler:

Sir--

Delighted as I am to receive notice from the outer reaches of opthalmology, I can only assume in this case that a diet of unrelieved science fiction has affected Dr Pedler's judgement.

To take his points in order.

1&2. Criticality is a divergent neutron chain reaction. In order to achieve this, a sufficient mass of Plutonium has to be assembled with a geometry which minimises the escape probability of the neutrons. It needs no genius to see that a sphere which minimises surface area for a given volume is the shape which will produce criticality with the smallest mass. Once one assembles a critical mass an explosion of some sort results. Quite clearly, the efficiency of that explosion depends on the construction: my design made no claims to being the most efficient bomb that could be made.

3. As for the "fearsomely complicated" electronics necessary for such a simple device to work well, the IRA do this sort of thing every day of the week. However, for the revolutionary who cares about nanosecond accuracy, the Atomic Energy Establishment at Harwell are offering their excellent - if a little outmoded - 2000 series nuclear instrumentation modules at the outstanding price of only £5 per hundredweight -- choose your own modules. I recommend from personal experience the 2219 timer.

4. I must confess myself a little puzzled about this item. Unless "neutron initiation" is some sort of nuclear Bar Mitzvah, I can only assume that Dr Pedler thinks you have to pump the Plutonium full of neutrons before it goes off. In fact any lump of fissile material will always contain stray neutrons -- from spontaneous fission, cosmic ray collisions, alpha emitting impurities, etc....

Once criticality is reached the number of neutrons produced which are available for causing further fissions exceeds the number which are absorbed parasitically or escape. In other words , the nuclear reproduction constant K_{eff} for the material becomes greater than unity. It goes bang all by itself.

It's all in the science books, so back to the eye charts, mate!

KOEST
SOCIAL

"No man is an island - he is a holon" - Arthur Koestler.

SOCIOLOGY CAN OFTEN give the appearance of a cluster of unconnected theories, bald assertions and rash conclusions based on scanty experimental evidence, shot through with orthodoxies such as Marxism, and lacking concensus even in its most central theorems. It comes as a very pleasant surprise, therefore, to find in think-tank generalist Arthur Koestler's "The Ghost in the Machine" a social model which seems to escape most of these sociological pitfalls and presents valuable - if not priceless - new insights into man's ostensibly crazy social behaviour.

The theory rests on the existence of "holons" - sub-units which can be real and structural or merely conceptual, and which form working hierarchies in all living systems, from bacteria to nations and planetary populations. The characteristics of Koestler's "holon", given in much fuller detail in Appendix 1 of the book, are briefly as follows:-

1. It is a sub-whole (holon)
2. It is made up of other sub-wholes, branching into sub-wholes of still lower order, and so on.
3. Parts and wholes in the absolute sense do not exist in the domain of life. The concept of the holon reconciles the atomistic and holistic approaches.
4. Holons are arranged in a multi-levelled hierarchy, from nations down to blood-cells and molecules. An individual man represents only one level of the heirarchy.
5. Each holon, whether a man, a local council or a body cell, is semi-autonomous. Within its own domain it is self-regulating and only refers cases to higher levels of the hierarchy when its built-in set of responses is inadequate to deal with the situation.
6. As well as self-assertive behaviour, biological holons display the dependent properties of parts. Koestler distinguishes an integrative, co-operative tendency and a personal, individualistic identity in the holons of living systems. This 'two-facedness' he calls the "Janus Effect".
7. The term "holon" may be applied to any stable biological or social sub-whole which displays rule-governed behaviour and/or structural Gestalt-constancy. The sub-routines of acquired skills are behavioural holons; phonemes, morphemes, words, phrases are linguistic holons; individuals, tribes, families, nations are social holons.
8. Each holon acts within a set of rules, called its "canon", which may be very limited or very flexible, depending on its "depth" (its sophistication, or the number of subordinate holons which it comprises).
9. Hierarchies are 'dissectible' into their constituent branches, on which the holons form the nodes; the branching lines represent the channels of communication and control (fig. 1).

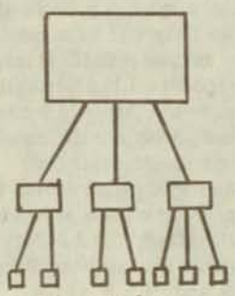


Fig 1 Holons

10. Structurally, the mature organism is a hierarchy of parts within parts. Its "dissectibility" into quasi-autonomous parts (fig. 2)

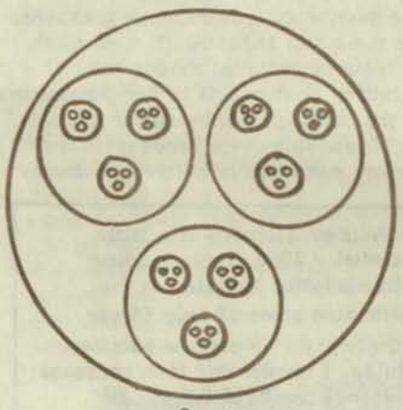


Fig 2

is demonstrated in transplant surgery.

11. The rules of conduct of a social holon are not reducible to the rules of conduct of its members.
12. The egotism of the social holon feeds on the altruism of its members.

The incisive accuracy of the last two statements, which I have left in Koestlers own words, will I hope become clear presently.

Koestler arrives at his theory by a tortuous route, beginning with an attach on behaviourist psychology and ending with a controversial proposal that a search should be initiated for a "wisdom pill" to overcome man's innate short-comings.

I would like to take up the very original central point of his argument; namely that it is tacitly assumed in most sociology, politics and philosophy that the ultimate aim of social organization is the benefit of man, whereas most of the evidence points in the opposite direction. Specifically, Koestler spends much of the third part of the book cataloguing the ways in which man's tendency to accept dogma and ideology wholesale has resulted in repeated disaster for man the individual, the pawn in the hand of the social holon (and, one might add, for the World holon itself in more recent times).

> "War is a ritual, a deadly ritual, not the result of aggressive self-assertion, but of self-transcending identification. Without loyalty to tribe, church, flat or ideal, there would be no wars; and loyalty is a noble thing"

Perhaps it is, but nowhere does Koestler come to grips with the possibility of directing the "noble thing" into channels which produce individual happiness rather than group success.

This is perhaps the supreme flaw in all social organization; that once the society becomes structured and hierarchically organized it takes on a separate transcendant identity and no longer concerns itself with the welfare of individual sub-units. If one happens to be one of these sub-units, it is obviously desirable to limit the growth of social structures and plan them with extreme care to retain your autonomy in these fields which matter to you as an individual. It might be desirable, for instance, that the group should provide you with food and transport, but not that it should exercise control over whom you marry or what time you get up in the morning. Using Koestler's hierarchical model, it is possible to work out in broad terms what sort of society is most likely to fulfil these conditions:-

Beginning with the simplest and most extreme examples, the DICTATORSHIP (fig. 3) is repres-

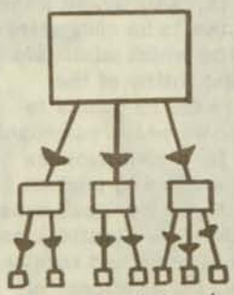


Fig 3 Dictatorship

ented by the simple tree model, with all the channels of communication substantially downwards in direction. The bottom-most holons (individuals) have no directive function and their importance to the social organism as a whole is minimal. Nevertheless, we might expect this sort of society to have a considerable survival potential, under some conditions.

TLER'S MODELS

In the diagrams which follow, an arrow thus → represents a channel of control, and an arrow thus ⤞ a channel of information flow. In both cases the size of the arrow represents the efficiency or importance of the channel.

The PURE ANARCHY (fig. 4) is a

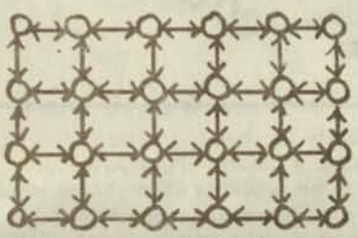


Fig 4 Pure Anarchy
[O = private citizens]

system in which no hierarchical structure of a permanent nature exists, decisions being taken by those affected to deal with each individual contingency. There are no areas in which the state exerts a coercive control over the actions of individuals, no laws, police, prisons, armies, private property, compulsory education or monetary system. The survival of this sort of society depends basically on an almost universal acceptance of its ethic, namely that all men are in actuality (not just in theory) equal, and that mutual co-operation is in everybody's interest. Examples of such societies have been historically rare, but close approximations have been reached in the Anarchist communes of Civil War Spain, religious communities such as Lopiano in France, Hippy communes in America and elsewhere, and on a smaller scale in progressive schools, urban communes, and even shared flats.

Our own competition-based society is a long way from this point, and in considering a society drastically different from our own we are apt to see problems which do not really exist. Lower industrial efficiency, for example, would be counter-balanced by lower requirements, production being related only to needs. It has been aptly said that if we ask not "what sort of society can we have?", but "what sort of society do we want?", then the Anarchist case is unanswerable. Whatever its practical difficulties, it offers the advantage that, almost by definition, it cannot act to the detriment of the individual interests of its members.

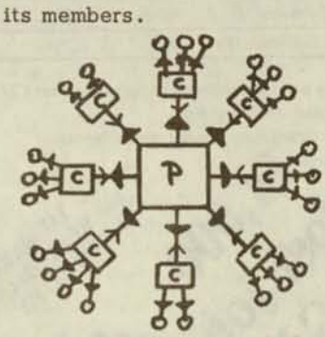


Fig 5 Communist State
[P = central Communist Party
C = local commune]

The COMMUNIST state is little different to the totalitarian state, in that all control is ultimately centralized. Member communes may or may not have a high degree of autonomy and may or may not exert significant influence on central policy. In other words lines of communication may be two-way or one-way, but in general power will flow from the centre outwards, and power vested in the Party at that, of which only a minority of citizens are likely to be members. The activities of the state may be further hampered by allegiance to a fixed dogma of Marxism, Maoism, etc., before which the interests of individual citizens must bow.

The TRIBAL SOCIETY, which usually comes first in the evolution of social forms, is really only a smaller model of the dictatorship, with overtones of inter-tribal violence which also tend to characterise the activities of national dictatorships.

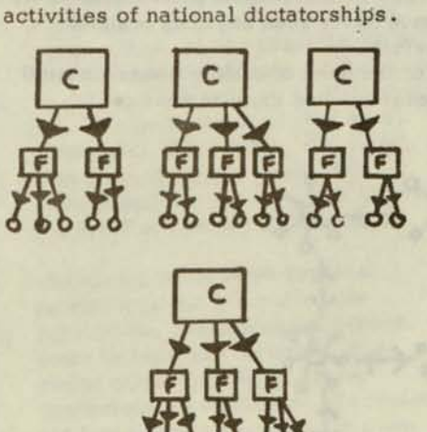


Fig 6 Tribes
[C = Chief, F = Family Head]

The PURE DEMOCRACY is an intriguing set-up in which all the power would at least seem to be vested in all the people. As in pure anarchy, there are few practical examples due to the demands such a state would make on the communications channels. If power must be retained at all as a social control it is perhaps best that it be regulated in this manner.

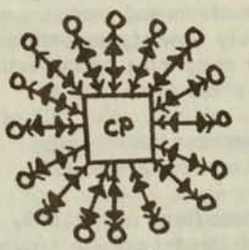


Fig 7 Pure Democracy
[CP = Central Power,
O = citizens]

The REPRESENTATIVE DEMOCRACY, which may be combined with elements of the pure democracy such as the right to referendum, is the system with which most of us are familiar. It has been said that in Britain a man is free once every five years (general elections), for the real power, as we all know, lies with the governing party. It is, therefore, more rightly described as an oligarchy, with the ruling class being selected by occasional ballot. This is the commonest form of social organization throughout the non-communist world, and has a multitude of fine variations.

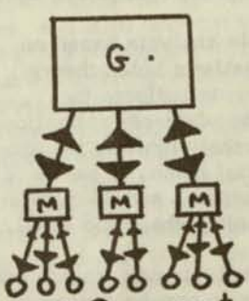
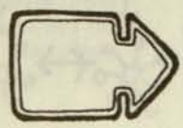


Fig 8 Representative Democracy
[G = Ruling Government Party, M = M.P.'s]

The ANARCHO-SYNDICALIST society is essentially a compromise between anarchy and democracy. The size of the social holon is deliberately limited, so that ruthless centralized power systems can now grow up, and small individual holons (communes, kibbutzim or syndicates) co-operate with one another as necessary. Within the syndicate control can approximate to direct democracy or anarchy (which are similar concepts). This is a system of social organization which has many attractive features, both from the environmental point of view and the socio/political. Most of what was said about pure anarchy applies, but the problems of



COUNTER INFORMATION SERVICES have published a new 'anti-report' this time on the General Electric Company - the third largest electrical corporation in Europe.

The first 'anti-report' by CIS concerned the activities of everybody's favourite enemy, the Rio Tinto Zinc Corporation. It met with much enthusiasm and prompted a considerably flow of suggestions for further companies whose activities could stand some form of alternative scrutiny; the bulk of these suggestions apparently concerned one company - GEC.

With a labour force of 181,000, GEC is the largest private employer in the UK; as the report points out, it has over the past four years also been the biggest unemployer. A glance at the company's vital statistics for the last few years reveals the key factors in the story. Between 1969 and 1972, sales have advanced by a substantial but not staggering £54 million from £921 million to £975 million. Pre-tax profits on the other hand have risen from £49 million to £77 million, a jump of around 60 per cent. During the same period,

GEC The Profit and Loss Account

Salient Features

	1969	1970	1971	1972
Sales (£ million)	921	891	924	975
Profit (£ million)	49	58	63	77
No. of Employees	230,000	206,000	195,000	181,000
Sales per Employee (£)	4,004	4,325	4,738	5,386
Profits per Employee (£)	213	281	323	424

In 1972 the average gross wage per employee was £27 per week (this includes management incomes).
(figures extracted from relevant annual reports)

Strong surge by GEC puts extra spark in shares

14,000 lost jobs at GEC

GEC TO MAKE 150 REDUNDANT AT COVENTRY

GEC men vote on threat of redundancies

GEC now reaping merger benefits

KOESTLER

identification and social organization are recognised more fully.
This simple analysis based on Arthur Koestler's holon theory would seem to indicate the desirability of de-centralization and of severely limiting the size of the social holon. A nation is too big, ruthless and dangerous; a family unit perhaps too small.

Such an analysis can provide some assistance to anyone genuinely wishing to build a better society when considering which theories are likely to be worthy of examination. Centralization of power and unconditional surrender to "noble loyalty" contain the seeds of global disaster and individual misery. The sooner man learns to put himself first and stop fooling around with "causes" the better.

Of course Koestler's conclusions are quite different. He sees in man a serious case of evolutionary mal-development; a failure to integrate ancient, animalistic drives with his very newly acquired intellec--tual gifts. His suggestion for a remedy is the "wisdom pill", the psycho-chemical agent which will perform this integration.

> "I believe that if we fail to find this cure, the old paranoid streak in man, combined with his new powers of destruction, must sooner or later lead to genosuicide. But I also believe that the cure is almost within reach of contemporary biology; and that with the proper concentration of efforts it might be produced within the lifetime of the generation which is now entering on the scene".

Though I wish him every success in this venture, Koestler must surely realize that, by his own argument, what is good for men is seldom what is good for the state. This ultimate threat to the power of kings, demagogues, politicians and emotional brain-washers would be resisted as we have never seen anything resisted before.
For the sake of completeness I should point out that there is another perfectly legitimate interpretation of Koestler's theory. Perhaps we are part of an evolving super-being which will ultimately transcend man in the same way as he transcends the cells of his own body. Models of such a Gestalt mankind are provided by science fiction stories such as Arthur C. Clarke's "Childhood 's End", Howard Fast's short story "The First Men" and John Wyndham's "Midwitch Cuckoos". Jung believed in the existence of a telepathically 'pooled' racial sub-conscious and the Brahmin faiths provide religious models. However we have no way of knowing whether or not individual men would "enjoy" participating in such an existence, if indeed it is a possibility.
Which brings me back to my point that it is in man's interest to avoid being transcended and surrendering his own aims and will to those of some higher order "holon" to which he does not count for a great deal
My own reactions to Koestler's holon theory are coloured, no doubt, by some of my own pre-conceptions. But I would urge you very strongly to read the full presentation of the theory in "The Ghost in the Machine" and also some of the discourse arising from it in "Beyond Reductionism" (edited Koestler and Smythies), for I feel it marks the beginning of a "drawing together" of all the strands of the physical and social science into some sort of unified, consistent structure.
As such, it may rate as one of the most important theoretical insights of the century.
No matter what your own particular field of interest you will find Koestler has something to say of absolutely basic importance and freshness.

DAVID GARDINER

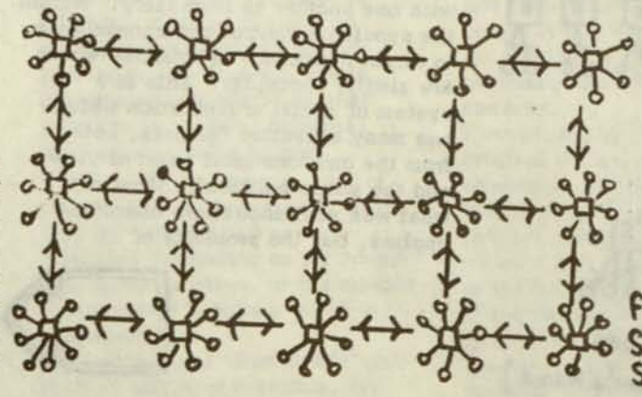


Fig 9 Anarcho-Syndicalist Society

the number of employees has dropped from 230,000 to 181,000 while the profits per employee have very nearly doubled. In summary, "There has ..... been a massive transfer of wealth to the shareholders of the company at the expense of the workers."

The CIS report follows the style of its predecessor in having the format of a directors' report to the shareholders but with a radically different content which concentrates on the gap between the glossy public image and the social costs of large corporations dedicated only to maximising their profits. As well as a full list of directors (with their shareholdings and other directorships) the report contains a detailed run down on the company's subdivisions together with a list of all its factories, and figures on the sales and profits of each product division. Information is also provided on the Company's interests in South Africa and its involvement in the arms trade.

Of the 64,000 GEC jobs which have disappeared since 1967, almost half have been through direct redundancy - the economic cost of which is borne by the taxpayer in unemployment pay and social security benefits. Substantial as these costs are, they are small compared with the human cost to the individual workers whose standard of living has been lowered and whose lives and social relationships have been disrupted.

Despite its central role, GEC is not the only party to emerge with little credit from the CIS analysis. The role of the Labour Government in fostering the merger and accepting the redundancies is criticised, as is the inaction of the national trades union officials in their tacit co-operation. "The unions .... have remained divided in their response to this attack on their members and have therefore proved singularly ineffective." Perhaps they felt that somehow GEC's activities were in the "national interest" - that conveniently loose term bandied around by those in power to justify their more unpopular actions to a disgruntled electorate. The most unfortunate aspect of this so-called "national interest" is that in practice it rarely refers to the interests of more than a very small proportion of the nation. And unless, as CIS point out, the "national interest" means nothing more than the interests of the shareholders of GEC, "it is patently absurd on economic, social and moral grounds that more and more workers should be added to the already enormous pool of unemployed to swell the profits of a tiny minority of the community. It is completely opposed to the real national interest."

For an understanding of the murkier aspects of large scale free enterprise the CIS report cannot be too highly recommended. It is cool, lucid and totally damning.

- Geoff Watts

The CIS report on GEC is priced 25p (10p to GEC workers) and can be obtained by sending a large stamped addressed envelope to Counter Information Services, 52 Shaftesbury Avenue, London W1.

'People are like elastic, the more work they have to do the more they stretch.'
Sir Arnold Weinstock, Financial Times 27.5.69

'Making more money is the only measure of more efficiency.'
Sir Jack Scamp, Personnel Management Sept. 1969.

'Weinstock's technique is to pick people and squeeze them until the pips squeak.'
One of Weinstock's managers. Sunday Times 4.7.71.

Lead Astray?

Anthony Tucker "The Toxic Metals" London, Earth Island, 1972 £2.50

A WIDE RANGE of metals are being released into the environment through increasing industrial usage, both in ignorance and with knowledge of their potential effect. This book is a serious and successful attempt to assess the problems of their general toxicology and ecological impact.

The task is formidable, if only because the source material is widely scattered throughout international scientific and medical literature, and the author has clearly had to optimise on content and readability. His journalistic style, and the glossary included, are an excellent guide for the environmentally-conscious non-scientific reader, but the sensationalism, particularly of the chapter headings ... "mad cats and dead men at Minomota"..., may deter others for whom the book would still be valuable.

The metals discovered fall into two general categories. Some, like lead and mercury, are ubiquitous, occurring naturally in soils and waters, present in all living organisms. They play no conceivable part in the evolutionary process, yet life has adapted to their presence in low concentrations. Other metals, chromium, cobalt, manganese, molybdenium, selenium and zinc, are essential in minute amounts to life processes and their absence is responsible for various deficiency diseases. The traditional metallic poison, arsenic, however also belongs to this category and, similarly increased in dosage, all the others are also demonstrably toxic. The safety margin is remarkably narrow or unknown.

Mr. Tucker, therefore, justifiably criticises those who maintain that because a metal is already present or is essential in the life process, it can be added to with impunity. He demonstrates how misleading their arguments can be. For example, they stress that at present rates it will take 2,000 years to double the concentration of mercury in the ocean. Yet, as Tucker points out, industrial mercury concentrates in esturaries and the waters of the continental shelf - that relatively small volume of the ocean which is also the most productive of fish and shellfish. Admittedly, most fish are not as heavily contaminated as at Minomota. Admittedly, the staple diet of most people is not fish. Does it follow that a low but increasing level of mercury is harmless?

Moreover, while even the most persistent, and the much more publicised, pesticides are broken down to harmless materials in a period of years, heavy metals continuously circulate in life cycles until eventually deposited in deep silt, a period probably of thousands of years. And, while DDT levels in human blood are considerably below the threshold of physiological effect, the lead level spread within the population overlaps that which has been shown to cause physiological effect.
Tucker discusses in much detail the insidious effects of long term exposure to such low concentrations, and also goes on to consider the possibility of two or more metals working synergistically to increase the effects. He looks at the mode of action of each metal, and especially of the more hazardous organic compounds of mercury and lead. He points, in particular, to the fact that some metallic derivations can readily cross the placental barrier and cause damage to the developing foetus.

All this may appear alarmist, but Tucker freely admits to using the most pessimistic values of contaminant levels or absorption rates. He contrasts them effectively, however, with the results put out by industry. He justifies his approach by the derivations on which health standards are based, which actually allow contamination to continue. He raises the anomaly whereby laboratory produced drugs, intended for short term selective use (on a small proportion of the population) have only to be linked with a cancer in an animal, obscurely related to man, and fed in excess, to be completely withdrawn, whereas evidence of direct harmful effects on human beings appears to be necessary before more appropriate control of industrially produced metal waste can be undertaken. He leaves us with the thought that, meanwhile, toxic metals are being generously applied to the whole eco-system.

REACTIONS


The significance of the Undercurrents leaflet is that it underlines how disastrous it would be if a plutonium shipment was successfully hijacked.
SECURITY precautions in Britain have recently been tightened up, according to British Nuclear Fuels, because of the danger of a hijack or armed raid by the IRA. They are now being reviewed again in the light of recent Arab terrorism.


MORE THAN 200 distinguished scientists at the Pugwash Conference on World Affairs in Oxford last month raised the alarm about the possibility of atomic bombs being used by tomorrow's terrorists. The conference's concern coincided with the publication in London of an underground leaflet which claimed to describe in details how to make a "peoples' bomb." PAUL EDE and BRYAN SILCOCK report on the dangers of nuclear blackmail


The leaflet, Towards a Peoples' Bomb, was published last month by a London group called Undercurrents and was syndicated in America by a New York underground news agency.
Its author—who used the pseudonym Pat Coyne—gave details of how to extract plutonium and published a diagram of a crude bomb he had designed.
He also pointed out the implications of leaving it in the left-luggage office of Charing Cross station, one of several other possible interdict [sic] among other things Buckingham Palace, the Houses of Parliament, Scotland Yard and the Elephant and Castle—not to mention vaporising a fair chunk of the River Thames.

THE SUNDAY TIMES, OCTOBER 1 1972

The chances of a nuclear hijacking

FIZZ....!

Sir--
The bloke who wrote the article on the DIY nuclear device had copied the chemistry of Plutonium out of a textbook very accurately, but he is deficient on a number of crucial facts which absolutely preclude amateur armageddon.
1. The high-explosive assembly he depicts will lead only to a sub-critical burn -- a messy and inefficient nuclear bonfire.
2. The design and construction of the explosive lens which drives the plutonium masses together took a team of topologists over two years continuous work. Its function is to assemble the critical mass in a certain shape to the nearest 0.0004 sec. Its shape and nature are totally secret.
3.The electronics necessary to detonate the explosive lens simultaneously all over is fearsomely complicated and quite beyond the averagely myopic revolutionary.
4. He has left out the neutron initiator altogether, without which nothing but a fizz.
It's all in the history books, so back to the drawing board mate.

KIT PEDLER
119, Park Hill,
London SW4

Pat Coyne replies: page 3

Pssst....

Sir-- May I first say how pleased I was to find UNDERCURRENTS on sale in Dublin recently . One spur of the moment purchase that paid off.
But, in the nicest possible way.....
Why go to the US for hydraulic rams? Blakes have been making them in England for years. Incidentally Dupar Pelapone produce not only wind generators but also solar cells and modern water powered generators.
I'm delighted to see that the Soft Technology Research Community have bought their farm in Wales. Even with small plots of grain, vegetables et al, I would imagine that in Wales the rainfall would be adequate not to have to irrigate with waste soapy water -- which we used as children to kill slugs.
And as a soft technology fridge, formerly used by the Irish at least for butter surplus to immediate needs -- place the butter deep in a peat bog and it does keep, for hundreds of years. But you do have to acquire a taste for slightly rancid butter.
The article seems to be a little ambivalent about the proposed community's relationships with conventional technological culture. There seem to be no qualms about using the fruits of hard technology -- generators, presumably polythene for solar energy, etc.-- but a certain reluctance to participate in the money handouts of Department of Agriculture grants.
And really, there is no need for a "member familiar with the grant system and able to operate it".
Most new entrants into farming can pick this up with very little trouble. Expertise is not normally required. On the other hand expertise is not really required for actual farming but expert advice is, with a little common sense. Expert advice is readily available from the Advisory services, and common sense from the members of the community: though some experience is hepful even under conventional management techniques. Initially, there are envisaged "poultry, pigs, a few cows, and possibly some sheep to provide meat, dairy products, wool, leather and other animal products." Poultry are fine for eggs, but on an extensive scale there might not be enough meat to supply more than a very occasional meal.Pigs can forage, give reasonable conditions, but the staple standby of beech nuts, etc., may not be readily available, and again production will be fairly low and a boar would have to be kept -- an uneconomical proposition for a couple of sows.
Sheep would provide a lamb and wool each year but would need reasonable feeding to produce more than a paschal repast.
Why not try goats as a "main crop"? They would give milk, meat, leather and hair, would survive better on a marginal food supply, and are st sturdier and more tractable than hens, cows or sheep.
Lastly, why barter for disposal of surplus communal goods?
It seems a little unsophisticated, demanding as it does a double coincidence of supply and demand on the part of both parties to the transaction -- especially when you are are, initially at least, the only one doing it.

David Grant-Couper
Cornahir House,
Tyrrellspass,
Co Westmeath,
Ireland.

UGH!

Sir--
I WAS SURPRISED to find that there are even in your paper people who suggest Hydroponics without warning about the unhealthy products you get. I personally won't eat them.
There is too much evidence that the people from the biological-dynamic movement or those with similar ideas are right. They detest chemical agriculture.
You must be careful not to put too much technology in Agriculture. Nature is perfect enough, so when you don't have natural circumstances where you can grow something, first try to create them, instead of running into some technical mess.
With many regards to you and your friends.

JAN BAHKEN
Nobelweg 109
Wagenigen
Holland

Linear motors?

Sir--
A FEW OF US in London with ASA sympathies have weighed up the possibilities of calculating what Anarchism will mean in terms of living specific areas of life, how such changes will be effected and hopefully get some useful ideas on strategy.
The idea was to produce a series of pamphlets on this theme as a basis for discussion. I am told the concept was well received at the ASA conference conference in Sheffield.
How to categorise the enterprise is difficult: it has strong elements of blueprinting , which has unpleasant associations for many ears.
Shortly, for example, I shall sketch out a pamphlet on Transport and circulate a few copies for addition and dissection. Needs, feasibility and transition will probably need equal coverage.
I know others have more drastic ideas --linear motors, readiness for revolutionary war, etc...
Perhaps readers would care to comment.

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