EXPENDITURE DETAILS

Direct Costs Only

	Current Budget Period				Next Budget Period			
	TOTAL		SRR		TOTAL		SRR	
PERSONNEL: (Cont'd.)	% of Time or Effort	Amount	% of Salary from SRR Grant	Amount	% of Time or Effort	Amount	% of Salary from SRR Grant	Amount
Technical Aide Bullene, R.	hourly	$ 281.	100	$ 281.				
Technical Aide Bundy, M.	hourly	1,202.	100	1,202.				
Technical Aide Dover, Richard	hourly	2,695.	100	2,695.	hourly	$ 750.		
Technical Aide Hoffman, Stephen	hourly	247.	100	247.	hourly	1,000.		
Technical Aide Leavell, Stephen	hourly	761.	100	761.				
Machinists		453.	100	453.				
Operations Mgr. Olsen, C.	100	10,500.	100	10,500.	100	11,[illegible].		
Operators		32,017.	93	29,748.		36,500.		
Student Res. Asst	--	--	--	--	50 (hrs.)	2,[illegible].		
Secretary Blanch, G.	100	7,413.	100	7,413.	100	6,600.		
Secretary Eckelson, G.	5	275.	10	27.	5	300.		
Secretary Foley, J.	9.4	646.	15	96.	9.4	700.		
Secretarial Assistance	--	--	--	--	2[illegible]	1,[illegible].	[illegible]	
Administrative Hoagboard, R.	5	800.	8	67.	5	8[illegible].		
Administrative Nagle, R.	15	2,400.	8	200.	15	2,[illegible].		
Associate Dir. Peterhold, G.	73	13,119.	100	13,119.	20	3,[illegible].	[illegible]	[illegible]
Total Salaries		174,767.		163,474.		237,3[illegible].		[illegible],
Total Benefits		20,587.		19,287.		29,0[illegible].		[illegible]
Total Personnel		195,354.		182,761.		266,39[illegible].		[illegible].
CONSULTANT SERVICES		500.	100	500.		1,[illegible].		[illegible]

[illegible] from Instrumentation Research Laboratory as needed.
[illegible] from Stanford Computation Center Operator Pool.

EXPENDITURE DETAILS

Direct Costs Only

	Current Budget Period		Estimated for [illegible]	
	TOTAL	CRR	TOTAL	CRR
PERMANENT EQUIPMENT				
Main Resource - Rented (Net After F. A. and Taxes)				
IBM 360/50				
[illegible]-50618	656.	612.	[illegible]	[illegible]
1403-14708	8,669.	8,091.	[illegible]	[illegible]
[illegible]-11047	84,859.	79,108.	[illegible]	[illegible]
[illegible]-11149	54,533.	49,341.	[illegible]	[illegible]
[illegible]-10102	78,517.	43,303.	[illegible]	[illegible]
[illegible]-10877	3,478.	3,246.	[illegible]	[illegible]
[illegible]-10738	10,201.	9,521.	[illegible]	[illegible]
[illegible]-12531	6,854.	6,397.	[illegible]	[illegible]
[illegible]-11144	10,524.	9,837.	[illegible]	[illegible]
[illegible]-20185	12,872.	12,014.	[illegible]	[illegible]
[illegible]-12464	11,269.	10,518.	[illegible]	[illegible]
[illegible]-10007(1)	15,267.	7,217.		
[illegible] (16 units)	3,202.	3,202.	[illegible]	[illegible]
[illegible] (10 units)	10,534.	10,534.	[illegible]	[illegible]
[illegible]-12326	31,205.(2)	31,205.	[illegible]	[illegible]
[illegible] Total Main Configuration	342,540.(3)	284,146.	[illegible]	[illegible]
[illegible] rade of CPU(4)			[illegible]	[illegible]
[illegible] - Additional Units				
[illegible]	7,752.	7,752.	[illegible]	[illegible]
[illegible]	2,671.	2,671.		
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]	696.	696.	[illegible]	[illegible]
[illegible] Net Rentals	6,551.	6,551.	[illegible]	[illegible]
[illegible] Lines	1,980.	1,980.	1,980.	1,980.
[illegible] for 15 CRT Interfaces			[illegible]	[illegible]
[illegible] Display			[illegible]	[illegible]
[illegible] Total Equipment	362,190.	303,796.	[illegible]	[illegible]

(1) April, May, & June, 1969 billed and paid March, 1969.
(2) Rental beginning 1/6/69.
(3) [illegible] Campus Facility participated in 2361 for full year; August-November only for other components.
(4) Estimate Delivery 9/1/69.

EXPENDITURE DETAILS

Direct Costs Only

	Current Budget Period		[illegible]	[illegible]
	TOTAL	SRS	[illegible]	[illegible]
SUPPLIES:				
a. Office	3,973.	3,973.	[illegible]	[illegible]
b. Comp. & Eng.	22,923.	21,824.	[illegible]	[illegible]
	26,896.	[illegible]	[illegible]	[illegible]
[illegible]	3,620.	3,520.	[illegible]	[illegible]
COMMUNICATION COSTS	4,418.	4,418.	[illegible]	[illegible]
RENT				
Computer Services 360/67	5,000.	5,000.	[illegible]	
Other				
Equipment Maintenance	2,412.	2,412.	[illegible]	
Books & Publications	157.	157.	[illegible]	[illegible]
Postage & Freight*	2,097.	1,873.	[illegible]	[illegible]
Telephone & Telegraph	5,245.	5,245.	[illegible]	[illegible]
Physical Plant	449.	449.	[illegible]	[illegible]
Technical Services	1,631.	1,631.	[illegible]	[illegible]
	16,991.	16,767.	[illegible]	[illegible]
[illegible] Direct Costs	609,969.	537,719.	[illegible]	[illegible]

*Includes $1,638.94 for freight incurred November, 196[illegible]; no additional [illegible] charges for domestics; total bill $1,[illegible]34.04.

Budget Justification

During ACME's third year the Stanford Computation Center Campus Facility trial period of attempting to market ACME service to non-Medical School users at Stanford was completed. Although there was a continuing level of use by this group of users, the utilization was not adequate to sustain the level of expenditures by the Campus Facility for ACME hardware, 20% of computer operators, and a file programmer. Consequently, the experiment was discontinued on the [illegible] of November, 1968; and considerable rebudgeting of ACME's expenditures within the NIH grant ceiling resulted from this termination.

The details of this rebudgeting were set forth in our letter to DRR of February 28, 1969. An increase in operating level from $621,425.00 to $[illegible] was requested with the increase to be funded with anticipated revenue from the Stanford Medical School Clinics and the Stanford Hospital Clinics for patient billing computing. If the full $20,000.00 of revenue from these sources is not realized expenditures will have to reduced even further in the remaining months to stay within the NIH award.

Additional expenditures are: $40,600.00 equipment rentals as a result of [illegible] paying for all the configuration of the 360/50 (except the incremental one million byte bulk core) from December on; additional salaries of $18,162.00 for 40% of operators instead of 80%, and the file programming effort. To offset these increases two programmers were transferred to the Stanford Computation Center - SLAC Facility, one programmer's time was reduced from 75% to 50%, a technician was terminated, and part of Gio Wiederhold's salary was transferred

to another account for the balance of the year. [illegible] graphics unit was also deferred, utilization of the [illegible] was reduced, and expenditures in supplies and equipment and travel expenditures classes were reduced. The ability to make the [illegible] demonstrated one value of ACME being linked with similar facilities on the University complex. We were able to hold a competent staff together even in a period of substantial rebudgeting.

The funding of ACME also had two unique features in the third year. In recognition of the unusually poor performance of the ACME configuration following the installation of the second million bytes of bulk core in the Spring of 1968, IBM granted a refund of rentals paid during a fifty day period. ACME's share of the refund was $31,748, which was slightly over the amount of $30,000.

User service charges were also inaugurated during the year. These were approved effective March 21, 1969. This gives us essentially four months experience with such charges; and based on the first two of these months, the total revenue for the current year will be approximately $20,000. Since this is $10,000 short of the budgeted goal at the time the proposal for the period was submitted, SRRB has granted an amended award increasing the total $[illegible] in consideration of the short period remaining, following approval of our rate proposal in the current budget period. A large majority of NIH grants at Stanford are non-competing renewals and therefore ineligible for computing charges until grant anniversary dates after July 1, 1969.

The principal investigators of the few "eligible" grants are corresponding with their individual sponsoring institutes for supplemental funds. The revenue from user charges to date has come from non-NIH government grants and institutional funds.

The estimate for the next budget period reflects the effect of the ACME Facility paying the full cost of the equipment and staff for the full year. Temporary staff reductions resulting from this years rebudgeting have been restored. The Macy Grant, which funded a part of ACME's expenditure in the first two years, has been exhausted; and without the participation of the Campus Facility, the Medical School computing facility will be funded entirely by the SRR grant and user charges.

The present year should be the last in which late invoicing by IBM will distort the cash expenditure for equipment. As indicated in a footnote in Section II-C, the April, May, and June 1968 rental of the IBM 2361 was not paid until March, 1969. A freight invoice for part of the original configuration was also invoiced and paid in the current year. Accounting for IBM rentals has been a serious problem at Stanford, but the problem has now been corrected and rentals are paid on a current basis.

During the year, the partial salaries for ACME administration by SCC staff members were assumed by the Medical School. The present charge for these administrative services is low and negotiations will be held soon to determine a more realistic effort distribution of the Stanford Computation administrative staff and an appropriate distribution of this time between direct and indirect costs of the NIH grant supported ACME. The inauguration of user charges has contributed substantially to the administrative burden.

Detailed Description of Resource Projects

Core Projects

As discussed in the Introduction of this Annual Report, the efforts of the core projects have been directed toward increasing the serviceability, reliability, and performance of the system. Although many of these problems are not glamorous in the scientific spectrum, the fact that a very advanced computer facility has come to the point where it can extend its efforts to improving its reliability and serviceability is certainly significant. Because of our efforts to maintain constant communication between users, usage has increased considerably.

Major efforts went into system measuring and system testing in order to preserve integrity of the system, even while continuing changes and adjustments are being made. In the real-time data-acquisition area we have achieved the capability to handle multiple users, each with multiple lines doing data acquisition and data distribution under routine timeshared operations. The ability to handle moderately high data acquisition within an interactive environment allows modification of the algorithm being employed by the user without loss of data; as far as we know this capability is unique to ACME. Continued efforts have been expended on the compiler and interactive control language development in order to insure that the system fulfills the needs as expressed by the users. Here, the efforts that are being expended are largely in response to request for additional capabilities that originated from the user community. System measurement is part of this activity so that we may predict how and where system changes will affect total system performance the most.

A fair amount of resource activity has also gone into the file maintenance programs which can now be largely run on-line. Our file reliability encourages medical users to keep data on line without worrying about back-up. Daily back-up runs and weekly complete system check runs are now an important part of operational procedures.

Due to the establishment of recharge rates, efforts have also gone into producing an accounting system with a proper audit trail which still runs at minimum overhead to the system itself.

Laboratory support, development, and testing have resulted in direct benefits to users who had greater need of computing assistance than the average user,

Development projects that have required a much smaller fraction of the core resource use are the display support for storage scope, the testing of algorithms for continuous system modelling programs, and the development of the assemblers for the 1800 computer part of the system which can operate inside the 360/50.

Usage of the ACME system is also made by our own staff while engaged in consultation for the medical school faculty and staff. A product of this work is the public EKG program which can be used to mark cardiology data acquired on-line. Statistical routines for users are developed by our staff and then made available on the PUBLIC files.

Internal usage of the system is also made for editing of the PL/ACME Manual and editing and preparing indexes for the ACME Notes. Other internal usage has been for teaching and demonstration of the system to visitors.

The bulk of this section of the annual report is devoted to usage that our users are making of the system. However, we do not feel capable of evaluating the scientific merit of these applications. In an organization serving well over 200

medical research projects, no single person would dare evaluate all these projects for their scientific merit, or place them in the proper perspective relative to each other. The allocation of the resource that is available at the Stanford Medical School for computation will be controlled in the future through the individual institutes themselves, by allocating grant monies to be used for research computer support. The individual progress reports are ordered alphabetically by the name of the researcher who requested the usage of the computer facility. Since the projects are described in the medical researcher's own wording, some inconsistencies in terminology--especially as they pertain to the description of the computer-oriented aspects of the project itself--will have to be excused.

ACME INDIVIDUAL USER PROJECTS

Angel, R. W.

Name: RWANGEL Project: ERCORECT

Department: Neurology (Veterans Administration Medical Center)

Project Description: Data reduction and statistical analysis of movement patterns, limb displacement, limb velocity, and electromyography in relation to both normal subjects and neurologically impaired patients.

Between now and July 1969 further data will be collected for both dissertation research (unsupported) and medical (neurology) research. Two publications are pending completion of research now underway.

Aronow, L.

Name: LARONOW Project: LCEL

Department: Pharmacology

Project Description: Routine laboratory calculations, including statistical tests of significance, in studies relating to the mechanism of action of anti-cancer drugs.

Atkinson, M.

Name: MATKINS Project: FLYHIGH

Department: Neurology

Project Description: We use ACME for Neurology research to help process data that our Linc-8 cannot easily handle. We send data down to ACME via the interface, perform several statistical operations on the data and then return the data to the Linc-8 via the interface.

Our data consists of digitized position, velocity, and EMG traces for a specific arm movement. Since the number of data points used is too great in some cases for our Linc-8, we use ACME.

Our plans to July 31, 1969 are to continue to use ACME for statistical manipulations of EMG traces.

No publications as of yet on our use of ACME, although one now being prepared.

Baldwin, R. L.

Name: RLBALDWI Project: OLIGOMER

Department: Biochemistry

Project Description: The project is characterization and helix -- forming properties (both kinetic and equilibrium properties) of short DNA helices formed by dAT oligomers of defined chain of lengths. dAT oligomers have the repeating and self-complementary base sequence ...ATAT... .

They may form either hairpin helices or dimmer helices, depending on conditions.

The aims of the project are: (1) characterization of loops in DNA helices; (2) measurement of the parameters controlling the cooperativity of DNA melting, and (3) measurement of the rates of the elementary steps of base pair opening and dosing in DNA helices.

Kaplan, H. S.

Name: GBAUSEK Project: HODPAT

Department: Radiology

Project Description: Lymphoma Data Program (LDP). The radiotherapeutic treatment of lymphomas, particularly Hodgkin's disease, has been shown to be the most effective way of achieving high cure rates. However, many aspects of these malignancies are still puzzling. For example, in addition to the obvious truth that we are still in the dark regarding the origin of lymphatic cancer, there appear to be significant differences between the lymphomas in their methods of progression, both in the presence and absence of treatment. The LDP has as its initial goal the accumulation in readily retrievable form, of data on many aspects of lymphoma patients. Items of importance are: results of physical exams of new patients, background information such as records of malignancies in the patients' families, early symptoms of the disease, laboratory data, method of treatment, and follow-up data (recurrence, retreatment, etc.).

From the analysis of such stored information, it is anticipated that inference can be drawn regarding optimun treatment scheduling and, hopefully, regarding the possible causes of these diseases.

Beard, R. R.

Name: R_BEARD_ Project: PREVMED

Department: Preventive Medicine

Project Description: We are making correlation computations. Analyzing behavioral responses and influences of inhaling carbon monoxide. An example: correlation of carbon monoxide in the breath with athletic performance.

Bellville, J. W.

Name: JBELLVI Project: PROBABIL

Department: Anesthesia

Project Description: This study is of the pharmacology of anesthetics and related agents. Statistical programs are stored in the 360/50, so that with the 2741 terminal on cue, the data are entered. Various procedures are carried out. For instance, the relative potency of a biologic compound and its associated 95% confidence limits are computed. Lambda, a measure of efficiency of the assay, is also computed. Standard statistical procedures are stored under this project, and carried out by research fellows or the principal investigator.

Bellville, J. W.

Name: JBELLVI Project: RESPIRAT

Department: Anesthesia

Project Description: This project involves the use of a special purpose analog computer that preprocesses data, which is then entered into 360/50 via the 1800. In addition, the 1800 interacts with the experiment to generate sinusoidally varying carbon dioxide which is administered to the subject. Thus, we are doing research not only on the basic physiologic mechanisms involved with the control of respiration, but on the use of digital computers on-line in the control of experiments in the acceptance of data from special purpose analog computers and the storage, analysis, retrieval, and display of these data. This represents an entirely new approach to the study of respiratory control mechanisms, and could not be carried out without the ACME facility.

Bernfield, M. R.

Name: MBERNFI Project: TRNA

Department: Pediatrics

Project Description: The ACME system is used by our lab to handle two tasks that would ordinarily take many hours of routine effort. (1) The program we have written takes the radioactivity found as aminoacyl tRNA at several points in time and computes the least square best fit to the log of the radioactivity left, and also gives the rate constant for the decay and the half time. (2) Some column and paper separation techniques used in our lab involve over 100 fractions, each double labelled. The program for this task takes the data generated by the scintillation counter and subtracts background and interference (cross talk) between the two isotopes. This data is then presented in graphic and tabular form as percent of the respective isotope by fraction number.

Bodmer, W. F.

Name: WBODMER Project: POPGEN

Department: Genetics

Project Description: Our main use of ACME is for the analysis and interpretation of data on human white cell antigens. A secondary use is for the analysis and simulation of population genetic models. We have developed a series of programs to facilitate the storage of our data with appropriate editing at the time of input and to facilitate a ready interaction between the experimental worker and the computer. This allows us, at short notice, to do small scale 2 x 2 analyses for serum characterization, selection of appropriate individuals for absorbtion and automatic typing according to complex patterns of serum reaction. These increased opportunities for interaction with the computer have been a great help in our day-to-day work and in establishing new relationships amongst our sera. Our future plans include the development of programs for the systematic analysis of family data.

Brast, N. B.

Name: NBRAST Project: CATALOG

Department: Medical Student

Project Description: The two program files and two data files in this project are an experiment to develop a simple, efficient, and inexpensive arrangement for storing and searching bibliographic information, e.g., items in a reprint collection or references for a library research paper. I have used this project in connection with a report for Physiology 150 and a laboratory project for Biochemistry 104.

During the next six months I shall attempt to complete documentation of the programs and, if they prove useful, submit them to ACME for inclusion in the Public Program Library.

Brast, N. B.

Name: NBRAST Project: RODENTS

Department: Medical Student

Project Description: This file contains programs which I have written for calculating descriptive and inferential statistics (e.g., t-test, analysis of variance, regression analysis) on experimental data. One of these programs, ANOVATWO (two-way analysis of variance, unequal numbers of data per cell) has been added to the ACME Public Program Library.

In the next six months I anticipate using this file for my own use in connection with course work in Medical School.

Bridges, J. C.

Name: JCBRIDGE Project: JCY

Department: Genetics IRL

Project Description: Write programs to control a quadrapole mass spectrometer; collect, manipulate and plot data from same.

Britt, R. H.

Name: RBRITT Project: [illegible]

Department: Medical Student - [illegible]

Project Description: These experiments [illegible] auditory pathway responses to meaningful acoustic stimuli. It is a common daily experience that the perception of sound is not [illegible] simply by the physical parameters of the stimulus (intensity, [illegible]), but that factors relating to attention, significance, and past experience also play important roles. An electrophysiological equivalent of the changing perception may be the dynamic alteration of evoked responses to [illegible] sound stimuli recorded in auditory pathway of [illegible]. These response modifications are due to activity in [illegible] including the middle ear muscles, the olivo-cochlear bundle, and descending auditory connections. The specific experiments to be [illegible] analysis of single unit discharge patterns in [illegible] cats making an acoustic discrimination; (2) the [illegible] olivo-cochlear bundle activity on single unit discharge characteristics in central auditory pathway; and (3) the neural response pattern in [illegible] squirrel monkey in response to natural vocalizations. [illegible] auditory unit discharges in response to meaningful acoustic stimuli differ from their response patterns to non-meaningful stimuli should expand our understanding of the role of the regulatory mechanisms in [illegible] perception.

ACME has been used for statistical analysis of histograms in the following paper: Starr, A. and Wernick, J. S. "Olivocochlear Bundle Stimulation: Effects on Spontaneous and Tone-Evoked Activities of Single Units in Cat Cochlear Nucleus," J. Neurophysiol., 31: [illegible], 1968.

Brody, W. R.

Name: B_BRODY_ Project: [illegible]

Department: Medical Student

Project Description: Desire to use ACME to assist medical students with learning the process of history-talking and formulation of differential diagnosis. Case histories will be entered into the computer and students will interrogate the computer to simulate an actual history-talking session. Project is presently an unsponsored pilot study.

Brody, W. R.

Name: BBRODY

Department: Medical Student

Project Description: I am using [illegible] simulations of non-linear [illegible] systems (unsupported project).

Brown, B. N.

Name: BNBROWN

Department: Pediatrics

Project Description: Studies involve [illegible] and analyzed. In addition, studies of [illegible] require correlations with age, body weight, [illegible].

Brutlag, D. L.

Name: DBRUTLA

Department: Biochemistry

Project Description: I have just begun graduate [illegible] useful ACME will be in my studies yet. [illegible] - During the past several months I have been studying the role of [illegible] mechanism of the enzyme DNA polymerase. [illegible] nonlinear weighted regression analysis of [illegible] test various theoretical models which describe how the enzyme works. I also use ACME routinely as a general laboratory [illegible] all of my experimental data. One program reduces [illegible] assays and prepares a written report. Another [illegible] from equilibrium dialysis experiments. I have also used ACME for [illegible] physical parameters of macromolecules from data obtained from the analytical ultracentrifuge.

Buchanan, B. G.

Name: B_BUCHAN Project: [illegible]

Department: Computer Science Department/Genetics

Project Description: Professor L. Cavalli-Sforza and myself will use ACME to teach medical students the foundations of statistics, with particular emphasis on medical applications. The course is Genetics 217, Spring Quarter, 1969.

Bunnenberg, E.

Name: EBUNNEN Project: CHEM

Department: Chemistry

Project Description: (A) The taking of high rate data transmission to write experimental analysis programs so as to develop programs for the routine analysis and finished output of mass spectra. The transmission is through the 270Y-270X channel. The project plans to develop this interface to service three mass spectrometers (ALTAS CH4, AEI MS9, and a FINIGAN 1015 quadrupole). The taken spectra are then to be fed to the Artificial Intelligence group under the supervision of J. Lederberg and E. Feigenbaum to be used in their dendral investigations. (B) Another use of data transmission through the 270Y is to take spectropolorimeter measurements and then analyze these spectra for form, bandwidths and similarities between derivitives for theoretical projections. (C) Also included is a battery of utility programs for metastable analysis, chemical rate analysis, C^{13} substitution ratios and other routine analysis that the Chemists wished programmed.

Butler, E. D.

Name: EBUTLER

Project: UROLOGY

Department: Surgery (Urology)

Project Description: ACME is used to study the dynamics of the urinary tract. The following measurements are made real time: (1) Electromyographs of the ureteral smooth muscle, (2) Urine flow rate, and (3) Blood pressure/fluid load/bladder pressure. Macroscopic analysis of these is made at the end of every 30 minute experiment with a graphical output typed out on the 2741 terminal. This provides feedback for the next 30 minute run. 10-15 such runs are made per complete experiment.

Microscopic analysis is made of item (1) off line on the effect of drugs on the waveform which necessitates use of the TV display console. Digital filtering, histogram plotting, averaging, and autocorrelation is performed. Data files are kept of the reduced data points. Several of the standard statistical subroutines are used, e.g., Fourier analysis, spectral analysis, frequency plots. A series of four papers are in preparation to be published in the "Journal of Investigative Urology" in early 1969 concerning work and techniques established entirely on the use of ACME for the data collection, presentation, and analysis. These will have a general title of "Dynamics of the urinary tract."

Cann, H. M.

Name: HCANN

Project: GUAT

Department: Pediatrics

Project Description: This research project is investigating factors which affect frequencies of genes controlling various human heritable characters. The extent to which selection, genetic drift, and migration affect frequencies of certain human genes is being assessed and specific selective factors are being sought. Environmental, cultural and historical conditions favorable for this type of study have been found in settlements of Mayan Indian descendents in the Lake Atitlan Basin of southwest Guatemala. The local microgeography and mating patterns appear to enforce a high degree of genetic isolation for each of a number of Indian towns and villages ringing Lake Atitlan. These high mortality populations provide the opportunity to study selective effects of human genetic polymorphisms. Studies of gene frequencies, segregation analysis of polymorphisms and demographic characterization of these sub-polulations are being undertaken.

This project will also contribute information on the genetic taxonomy of the American Indian. Families of large size, characteristic of the study population, will afford excellent opportunities for medical genetic investigation of inherited diseases encountered in our field activities and for studies of genetic linkage.

Two communities on the east shore of the lake are being studied and we are about to initiate studies in another Indian lake shore community. A pilot project involving 300 inhabitants of two Indian communities on the south shore of the lake was completed prior to undertaking the present investigation.

..., R. B.

Name: RBCLAYTO Project: SEXBR

Department: Psychiatry

Project Description: The purpose of our project is to determine the effects of steroids and hormones of RNA activity on the brain. We inject live rates with radioactive tritriated uridine. The rats are then killed and processed in the regular histological procedure. Radioactive element reduces silver grains and slides are made from which the grains in the brain cell are counted. From the number of grains, we determine the area of RNA incorporation in the brain, the brain cell, and other tissues. The level of RNA incorporation is also determined. Experimental and control groups are compared by ACME. Our data analysis time is greatly reduced by using ACME.

Collins, K. D.

Name: KCOLLIN Project: ATCASE

Department: Biochemistry

Project Description: This file (KIM COLLINS, AT Case) is used for three purposes: First, it is used in a variety of ways as a research tool. It has been used to compute the dissociation constants for an enzyme (AT Case) and some of its inhibitors (see Journal Biological Chemistry, approximately February 1969; "Aspartate Transcarbenglase: Studies of the Catalytic Subumt by Ultraviolet Difference Spectroscopy," by Kim D. Collins and George R. Stark). It will be used in the future to simulate difference from model compounds and compare these spectra with the experimental spectra. It will also be used in the future to analyze data from equilibrium dialysis studies of AT Case and its substrates and inhibitions.

Second, it is used as a data processing facility for research-generated data. It is extensively and routinely used to process chromatograms from an amino acid analyzer; a long program stored in ACME provides a variety of different procedures that may be used on the data (See previous ACME write-up).

Third, it is used as an education device. For instance, this file has been used to process data from a laboratory course in ultracentrifugation (Biochemistry 214).

V. A.

Name: VABACON

Project: GAM

Department: Genetics - IRL

Project Description: DATA COLLECTION, STORAGE, ANALYSIS FROM FINNIGAN 1015 MASS SPECTROMETER. In this "on line" application, the decision making capabilities of the computer are coupled with those of an operator to direct the operation of a Finnigan 1015 quadrupole mass spectrometer.

The computer is used to actively direct the operation of the mass spectrometer by controlling the mass filtering system of the instrument. It is used to recognize and control the voltage changes which define mass peaks and enable the rapid collection and presentation of data.

The computer traces out peak shapes of the known masses in a reference gas allowing the operator to determine correct mass positions, and to enter any shifts in calibration into the computer register for compensation automatically.

While taking data the information may be displayed on an oscilloscope or recorded on magnetic tape. Once data is acquired the structural identification of organic compounds is made from orthogonal coordinate or spiral base plots of mass spectra made by computer direction of a calcomp plotter. The system is also used to analyze Gas Liquid Chromatograph effluent permitting the structural identification of mixtures of organic compounds.

Stored data offer the future possibility of spectra matching of unknown compounds. Publications using this system of computer operation of the mass spectrometer are:

B. Halpern, V. A. Close, A. Wegmann, J. W. Westley, "Gass Chromatography of Amino Acids as N-Thiocarbonyl Ester Derivatives", Tetrahedron Letters 27, 3119 (1968).

J. W. Westley and B. Halpern, "The Use of (-)-Methyl Chloroformate in the Optical Analysis of Asymmetric Amino and Hydroxyl Compounds by Gas Chromatography" J. Org. Chem. 33, 3978 (1968).

J. W. Westley, V. A. Close, D. N. Nitecki, and B. Halpern, "Determination of Steric Purity and Configuration of Diketopiperazines by Gas-Liquid Chromatography, Thin-Layer Chromatography, and Nuclear Magnetic Resonance Spectrometry Anal. Chem. 40, 1888 (1968).

[illegible] R. L.

Name: RLCONNER Project: RATRACE

Department: Psychiatry

Project Description: There are approximately 15 individuals in this laboratory directly involved in experimentation relating neuroendocrine function to behavior. Information from animal testing chambers will soon be recorded on a high-speed paper-tape punch. The data on the paper-tapes will be dumped directly into ACME data files through a PDP8 interface, or listed by the PDP8 for keyboard terminal input to ACME. In either case, a program in the permanent ACME files will be written to sort the data from the several experiments recorded simultaneously on the paper-tape. Appropriate programs for the analysis of data from specific experiments will also be maintained in the permanent program files. In addition, we plan to use ACME facilities to reduce and analyze data derived from experimentation which does not involve use of our paper-tape recording system, e.g., adrenocortical steroid levels of animals under various conditions and ACTH bioassay data.

Cooper, J. M.

Name: JMCOOPER Project: SEXDIFF

Department: Psychiatry

Project Description: At present I am using ACME for two purposes only: (1) comparison of 2 sets of data by means of the t-test, and (2) calulation of sample radioactivity together with standard deviation thereof. I do not envisage expansion of this work.

Such use is not mainstream to my project, in that the calculations could be performed manually.

My project lies essentially in investigation of biochemical correlates of neonatal sercual differentiation in rats: such as androgen metabolism.

Daughters, G. T.

Name: G_DAUGHT

Project: SECURITY

Department: Medical Research (Palo Alto)

Project Description: This project is a study of insurance (Medical) utilization. A comparison of membership and doctor visits, laboratory work, etc., of the same population under two different insurance plans is being made.

Studies of costs to the patient (according to diagnosis) are also being made on the same group, for the two different plans.

The results should be of wide interest to employers, insurers, hospital planners, etc.

Daughters, G. T.

Name: G_DAUGHT Project: PLAYTIME

Department: Bioengineering and Physiology

Project Description: This project is purely educational in nature. It is desirable to make a knowledge of a high-level scientific computer language one of the standard tools of today's research scientist. PL/ACME is such a language, and being FORTRAN based, is useful wherever a machine with a FORTRAN compiler is found. The availability of a machine as large as ACME's 360/50 is a definite asset in learning how to use a computer on scientific problems, since storage space is almost never exceeded, and programs can be very straightforward.

The Palo Alto Medical Research Foundation has active training programs (one supported by N.I.H.) in Molecular Genetics, Allergy, Immunology, Infectious Diseases, and Bioengineering. There are currently several post-doctoral fellows in training at the Foundation, and members of the Foundation staff hold faculty appointments at Stanford University and the University of Santa Clara.

Those of us at the Foundation who are relatively competent in the ACME language have been giving informal instruction to members of our staff who have taken an interest in using the computer as a research tool, and the terminal sees almost full-time use only a month after installation in a facility where only two people had had any previous computer training.

DeNardo, G.

Name: GDENARD

Project: XENON133

Department: Nuclear Medicine

Porject Description: This project involves the use of radioactive methods to assess the regional distribution of ventilation and pulmonary blood flow in normal subjects and subjects with disease. A scintillation camera and special purpose computer are used to generate positimal and quantitive information for subjegnent processing by ACME. Studies in upright man have revealed that the distribution of ventilation is determined by the pre-inspiratory and inspiratory volumes.

We propose to study pulmonary embolism with these radioactive methods and compare the results with those obtained from conventional pulmonary function studies.