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State of New Jersey
GLASSBORO STATE COLLEGE
GLASSBORO, NEW JERSEY 08028

OFFICE OF THE PRESIDENT
609 - 445 - 5202

April 6, 1976

Dr. Charles W. Schultz, Chairman
Chemistry Section
Department of Physical Science
Glassboro State College

Dear Chuck:

Many thanks for the document outlining the development of the chemistry program and possibilities for its further direction here at Glassboro. It is an impressive document, well prepared and describing some very real progress--and realistic goals for the future. Copies of the document will be sent along to our Board for their information and to alert them to the successes--and needs--of our chemistry program.

Briefly, let me comment in three areas. In no way do I intend to be critical of what has been done; I do want to give you some of my perceptions.

- (1) Resources: With the conclusion of the State/Union Agreement, there would appear to be guarantees that all faculty now on our "no-for-fiscal-reasons" list will return. I am confident that your first imperative, the retention of chemistry faculty, will be attained.

The availability of space, stockroom help, dollar resources to support research and professional growth, and in-load time for research are more difficult problems to address. We will look at Rooms 304M, 304L and 316 with an eye to possible conversion. I will need your help in arguments for additional dollar and time resources for research and travel.

For next year, I see little relief from our stringent financial problems. But we are now beginning work on the budget for 1977-1978. It seems a long way off, but time does move swiftly and we do need to be prepared. In this budget I intend to ask for special resources to support professional growth of faculty and faculty research, but to do this successfully will require help from all departments. From chemistry I would like to have the following, in addition to your report.

- (a) List of faculty and their research publications since 1970.
 - (b) List of faculty research intentions for 1976-1978: project title, whether this is a solo adventure or whether it will involve students and if so, how many.
 - (c) List of research proposals submitted or about to be submitted to federal, state or other outside agencies.
 - (d) Rough estimates of research budgets, limited to supplies, equipment, etc. to augment (b) above.
 - (e) Listing, with costs, of high priority meetings to be attended in 1976-1978. Also, indicate here number and costs of ACS short courses to be taken by faculty.
 - (f) Estimates of faculty work load, individual by individual. This is a touchy subject, I know, but I see it as being very helpful. I'd like to know, truly, just how many real hours are spent in the classroom, in the laboratory, counseling and advising students, preparation for classes and development of new courses and in participation in activities with the chemical profession. There are fools in Trenton who believe that a 12-hour load means 12 hours on campus and the rest of the time at the shore or on the golf course; I'd like some hard data to counter this argument and justify additional time in-load for research.
- (2) Students: I was particularly struck with what appears to be a binoded distribution of scores on the ACS standardized examinations. I'd be interested in a further break out of these scores to determine whether our full-time, more traditional students cluster at one end or the other of the scale or whether there is a uniform scattering of scores across both our full-time and our part-time student populations.

On a different matter, it seems to me that there are at least four groups of students to whom we must direct our attention: the traditional, coming directly from high school; the county college graduate; the employed student with less than a B.A. hoping to upgrade skills and the B.A. chemist looking for retraining to fight off obsolescence. These categories may overlap, but for the sake of argument, consider them as separate.

How are we moving to recruit from each category? Particularly, how closely do we articulate with the county colleges in both their A.A. or A.S. transfer programs and in their chemical technician programs?

How are we moving to attract particularly able students to our program? I have attached a report that indicates clearly that we have an untapped market in those students who go out of state for their education, claiming that there is no quality education available in-state for them. It's not enough to deplore this lack of understanding--what is being done to counter this misperception and what help do you need from the College (admissions, community relations, etc.) to further your actions?

April 6, 1976

My own experience indicates that, although there may be relatively few chemistry majors moving through any department, many students do much work in chemistry in preparation for careers in the health sciences, in environmental studies and in biology. However, I have real qualms about developing special courses in chemistry to meet these special interests. All too often these courses are weak and of relatively little real content. The student gets a smattering of science, but doesn't really understand enough of the basics to use the course later in understanding the chemical basis of his own field. Thus, I am not particularly enthused about a special course for home economics people. Rather, the general courses should be incorporated into their programs. On a broader front, I think the science-oriented programs, be they in biology, environmental studies or what have you, should include requirements in chemistry, physics and mathematics and these required courses should be common to all programs.

- (3) Curriculum: Here, I must confess some qualms about the program in chemistry. From my reading of the course tables, coupled with the catalog descriptions, I see essentially a classical program similar to the one I had as an undergraduate and in which I taught both in graduate school and in my own professional teaching career. But much has happened to chemical education and there are new ways to put together the basic curriculum. I'd like to see some thoughts given to this matter, although I'll admit that simply getting the classical courses in place has obviously been a time consuming and difficult task for all concerned.

Finally, let me alert you to some additional possibilities that the chemistry program may well wish to explore. First, we do have a new program coming on in cooperative education under Stewart Potter's general direction. Although Stu is now in administrative studies, the thrust of this program is collegewide and not limited to business students. Second, we have made some rudimentary contacts with the people at Drexel. The possibility of a 3-2 type program in engineering is open to exploration. Obviously, a program of this sort would require heavy input from the basic sciences during the first years of the students' work on the Glassboro campus. You might want to talk to Dean Alan Donovan on both these matters.

Again, my thanks for what I see as a fine report, well developed and describing some very real successes in the growth of the chemistry program. I would appreciate a response to my list of requests for incorporation into my fight for additional resources.

Sincerely,



Mark M. Chamberlain
President

MMC/rm

cc: ✓ Dr. Brown
Dr. Donovan



State of New Jersey
GLASSBORO STATE COLLEGE
GLASSBORO, NEW JERSEY 08028

March 31, 1976

Dr. Mark M. Chamberlain, President
Glassboro State College
Glassboro, New Jersey

Dear Dr. Chamberlain:

The current uncertainty in the educational climate at Glassboro State College has prompted the Physical Science Department to re-examine our Chemistry program. The enclosed document reviews the development of the Chemistry program, demonstrates the quality of our present program, and is also intended to show the excellence which can be attained if we receive the appropriate institutional support.

We hope this document will be of value as you plan the future shape of education at Glassboro State College.

Sincerely yours,

Rhys H. Craver, Jr.

Rhys H. Craver, Assistant Professor
of Chemistry

Paul A. Dike

Paul A. Dike, Chairman,
Physical Science Dept.

Lee A. Dinsmore

Lee A. Dinsmore, Assistant Professor
of Chemistry

Alfred M. Jenkins

Alfred M. Jenkins, Professor of
Chemistry

George M. Leder

George M. Leder, Assistant Professor
of Chemistry

Michael D. Miller

Michael D. Miller, Assistant Professor
of Chemistry

Charles W. Schultz

Charles W. Schultz, Chairman,
Chemistry Section.

LAD:Y

CC - Dr. Lawson Brown
Dr. Alan Donovan

CHEMISTRY AT GLASSBORO STATE COLLEGE: "PAST, PRESENT AND ? "

A Report from the Physical Science Department

Prepared by Lee A. Dinsmore and Michael D. Miller.

March, 1976

The Liberal Arts program in chemistry at Glassboro State College was begun in 1969; the first class graduated in 1973. The purpose of this report is to:

1. Assess the progress of the chemistry program.
2. Show that curriculum and faculty additions have resulted in a chemistry program which compares favorably with those of other institutions, not only in New Jersey, but throughout the Nation.
3. Demonstrate that the Chemistry section of the Physical Science Department has been able to satisfy a large and growing demand for quality education in chemistry from area industries and secondary schools.
4. Show that the graduates of the chemistry program have established a record of outstanding job placement success.
5. Demonstrate a need for placing the chemistry program at G.S.C. at a high level of programmatic priority with respect to retention of non-tenured faculty and allocation of institutional resources.

Past Growth

Table 1 shows a comparison of the chemistry program in 1969-70 with that of 1975-76:

Table 1. Comparison of Chemistry at G.S.C. in Academic Year 1969 with 1975.

	Faculty		Courses		Majors
	Number	%Ph.D.s	Number offered	Enrollment	Total Number
1969-70	4	50	8	178	5
1975-76	6	83	28	635	48

In 1969 the Chemistry faculty consisted of 4 members (two of whom had Ph.D. degrees), representing two of the five major chemical specializations recognized by the American Chemical Society. Since 1969 four new faculty have been added with Ph.D. degrees in inorganic, physical, organic and radioanalytical chemistry. Thus in 1976 the faculty consists of six members, five with Ph.D. degrees, (one working on his Ph.D.), and representing all five A.C.S. specializations.

Since 1969 the number of courses offered and the total number of students served has more than tripled.

Table 1 also shows that the number of chemistry majors has increased almost tenfold since 1969.

Table 2 shows a comparison of the specific courses available in academic year 1969-70 with those of 1975-76. This list clearly shows that the added courses have greatly broadened the options available to students at G.S.C. In particular, these courses include all those needed for the preparation of students for advanced work in chemistry, medicine, dentistry, environmental studies, and other sciences. Further, G.S.C. students are now offered preparation for industrial careers and for science and chemistry teaching. This can be contrasted

with 1969-70 when graduates from the G.S.C. science program were prepared only
or general science teaching careers.

Table 2. Chemistry Courses Available in Academic Years 1969 - 70 and 1975 - 76

<u>1969 - 70</u>	<u>1975 - 76</u>
organic Chemistry I	General Chemistry
Inorganic Chemistry II	Environmental Chemistry & Pollution
Organic Chemistry I	+ Demonstration Techniques in Chemistry
Organic Chemistry II	Inorganic Chemistry I
General Chemistry	Inorganic Chemistry II
Physical Chemistry (1 semester only)	Organic Chemistry I
Chemistry of Biological Materials	Organic Chemistry II
Modern Chemistry (Graduate)	Quantitative Analysis
	Physical Chemistry I
	Physical Chemistry Lab I
	Physical Chemistry II
	Physical Chemistry Lab II
	Inorganic Chemistry III
	Instrumental Methods
	Seminar I
	Seminar II
	Research I
	Research II
	* Biochemistry
	* Organic Preparations
	* Advanced Organic Chemistry
	* Organic Qualitative Analysis
	* Advanced Analytical Chemistry
	* Glassblowing (Graduate)
	* Biochemistry (Graduate)
	* Advanced Thermodynamics (Graduate)
	* Quantum Mechanics (Graduate)
	* Special Topics (Graduate)

+ Intersession course.

* Courses offered in alternate years.

The potential student demand that could be generated from those already employed in the large South Jersey chemical industry has long been recognized. In 1974 we expanded our role to serve a broader segment of the South Jersey community by adding a series of night courses at the junior - senior level. These courses, in conjunction with the lower division courses that had already been offered at night, are designed not only for the student who wishes to obtain a liberal arts chemistry degree, but also for those who wish to modernize and update their knowledge in a specific area of chemistry. Not only has this policy attracted industrial personnel to G.S.C. for individual courses, but significant demand by students wishing to matriculate in the chemistry program is now becoming evident. Without such a program at G.S.C., many of these people would be denied a higher education.

Table 3 lists some of the companies and schools whose personnel have taken advantage of our chemistry night program. This year we have served approximately 135 students in 8 different night courses.

3. Partial List of Companies and Schools Represented in Night Course Enrollments

Companies

Air Products
BASF Wyandotte Corp.
Bonnell Plastics
Camden Research
Campbell Soup Co.
Champion Valley Farms
Cherry Hill Medical Center
Defense Personnel Support Center, Phila., Pa.
DeSai Plating
DuPont, Chambers Works
DuPont, Glasgow, Delaware
DuPont, Jackson Laboratories
DuPont, Newport, Delaware
First Pennsylvania Bank
GAF Corp.
Ginza
Gloucester County Regional Sewerage Authority
Harleco, Inc.
Hungerford & Terry, Inc.
Inolex, Inc., Phila., Pa.
Institute for Medical Research
J. P. Fazzio, Inc.
Lakeland Hospital
Lennox China
Mobil Research & Development Corp.
Our Lady of Lourdes Hospital

Companies

Owens Corning Fiberglass
Philadelphia Naval Hospital
Pitman Laboratory
St. Christopher's Hospital for Children, Phila, Pa.
Shell Oil Co.
Smith, Kline and French Labs
State of New Jersey
Underwood Memorial Hospital
U. S. Public Health Service
Vineland Chemical Co.
Vineland Laboratories
Wall and Ochs Opticians, Inc.
West Jersey Hospital
White Hall Labs

Table 3. (continued)

Schools

Archway High School
Audubon High School
Bridgeton High School
Bridgeton Junior High School
Burlington County Vocational Technical School
Camden County Vocational Technical School
Cape May County High School
Cherry Hill East
Cheltenham, Pennsylvania School District
F. L. Walther School
Gateway Regional High School
Glassboro High School
Kingsway Regional High School
Lamb Junior High School
Millville High School
Monongahela Junior High School
Morgan Village Middle School
Paulsboro High School
Philadelphia Board of Education
Pitman High School
Sacred Heart High School
Triton Regional High School
Vineland High School
Washington Township High School

The large industrial complex in South Jersey has a continuing need for people trained in chemistry. It can be seen from the response to our night program that we are fulfilling a real need in this area.

The growth documented in the previous pages has resulted in a Chemistry section of the Physical Science Department staffed by highly qualified scientists, offering a broad and complete range of courses, and which fills a growing demand from a broad spectrum of the South Jersey community.

Present Status

The excellence of a program can be judged by the success of its graduates. Table 4 shows that 95% of our Liberal Arts graduates gained employment in a chemical field or entered graduate school.

Table 4. Placement of G.S.C. Graduates. *

	<u>Chemistry</u>	<u>All G.S.C.</u>
Graduate School	35%	4%
Employment in field of training	60%†	51%
Other	5%	45% *

* Data for chemistry graduates is cumulative since 1972/73, the first graduating class. Data for all G.S.C. (obtained from Don Mumford, G.S.C. Placement Office) is for the 1975 graduating class.

†25% Industry, 35% Teaching.

*10% employed not in field of training but at level commensurate with their education, 35% underemployed or unemployed.

These data clearly show the substantial success of the chemistry graduates, particularly in view of the fact that these were years of high unemployment. The comparison of successful placement of chemistry graduates with that from all G.S.C. is obvious.

Accreditation by the American Chemical Society was sought in 1974. On February 10, 1975 Dr. B. P. Dailey, representing the A.C.S. Committee on Professional Training conducted a facilities and staff evaluation. On April 30, 1975 the Committee wrote to President Mark M. Chamberlain:

"Your program of undergraduate education in chemistry has continued to progress and is supported by good instrumentation, building facilities, and library holdings. The staff members responsible for the chemistry courses are competent scientists and educators, and staff balance is good."

Nevertheless, the request for accreditation was denied. The following reasons were cited:

- (1) rigor, level and difficulty of course presentation is insufficient;
- (2) insufficient number of entering chemistry majors of good potential and adequate secondary school preparation; and
- (3) teaching load levels for staff members should permit modest amounts of individual research.

A.C.S. accreditation is not an easy goal for an institution to achieve.

In 1974, the latest year for which figures are available (1), only fourteen out of thirty institutions applying for A.C.S. accreditation were approved. Perhaps we were overeager in applying for accreditation, since our chemistry program is relatively young (to date we have graduated only three classes).

We do feel, however, that the first reason cited by the A.C.S. Committee on Professional Training is totally without foundation. The only data gathered by Dr. Dailey relating to course rigor, level and difficulty were (1) the textbooks used and (2) sample copies of examinations. No objection could be raised to the textbooks; nationally recognized and accepted texts are used in all of our courses.

(1) Chemical and Engineering News, April 28, 1975, p. 27.

Further, the textbooks determine the level of difficulty of our courses; we do dilute our presentations of the material. Therefore, we must assume that the committee's first objection was based on the exams that they saw. We now realize that the A.C.S. probably overlooked Glassboro State College's unusual policy of not having a final examinations week. This limits our examinations to one hour and fifteen minutes, and consequently prevents comprehensive coverage of an entire semester's work on a "final" examination.

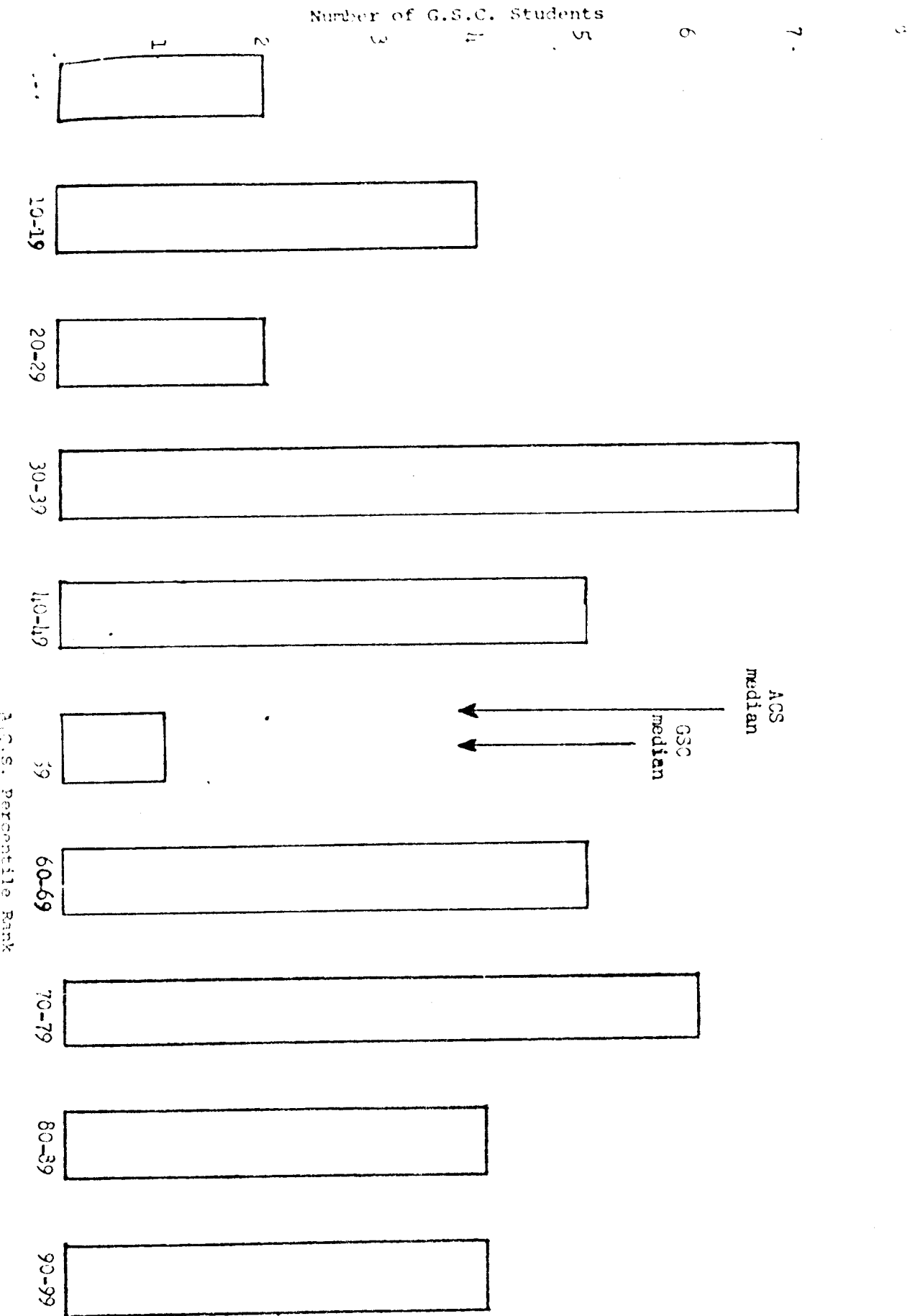
The implication of this objection is that our students are not well prepared. In order to determine the validity of this objection we have given five A.C.S. nationally standardized exams to four different classes: Quantitative Analysis, Physical Chemistry I, Physical Chemistry II, and Instrumental Methods. The results of these examinations are summarized in Figure 1, see page 12.

These results clearly show that our students' abilities compare favorably with the A.C.S. norms. The average score of the Glassboro State College students (54th percentile) compared with the norms (50th percentile) established from A.C.S. accredited institutions, in fact shows our students above average. Furthermore, 35 percent of our students scored above the 70th percentile, while only 20 percent of our students scored below the 30th percentile. These data invalidate the first objection raised by the committee.

The second reason cited by the A.C.S. Committee for denying us accreditation was that an insufficient number of students of good potential and with adequate secondary school preparation enter the G.S.C. chemistry program. We feel that this is true to some extent; many of the top graduates of area high schools attend out-of-state universities. John Walsh, writing in Science, the journal of the American Association for the Advancement of Science (1), recently

(1) Science, August 22, 1975, p. 619.

Figure 1. A.C.S. Percentile Ranking of G.S.C. Students - 1975.



and, "New Jersey has been known as 'the Cuckoo bird state', for the numbers of
of its residents who attend colleges in other states." A recent article in the
Gloucester County Times (1) specified that "Forty percent of those New Jerseyans
that want to go to college must go out of state."

Until 1969 Glassboro State College was unable to meet the needs of the
science oriented academically talented student. Programs offered at that time
were suited only for teacher preparation in general science. However, even though
G.S.C. is now able to offer a quality program in Liberal Arts Chemistry, its image
as an institution offering only programs for teacher preparation persists.
Although we have done much to publicize our Liberal Arts Chemistry program and
have seen substantial growth in enrollment of chemistry majors (Table 1), our
effort to attract more high quality students is still hampered by the College's
past reputation.

This is now changing due to several factors. The Chemistry section is
continuing a program of high school visitations wherein high school students are
invited to tour our facilities, meet our faculty, and are shown how some of our
instrumentation can be used for the solution of relevant problems. Several of
these students have shown considerable surprise that Glassboro State College has
such a well developed Chemistry section, and have expressed interest in enrolling
at G.S.C.

The reputation of the Chemistry program is also being enhanced by the
quality of our chemistry graduates who are teaching in area high schools. More-
over, these teachers are upgrading the level of secondary school preparation of
entering freshmen. Further, many other science teachers enroll in our night
chemistry courses to refresh and modernize their knowledge. This serves not only
to upgrade the level of preparation of our entering students, but also to improve

(1) Gloucester County Times, March 10, 1975.

age in the community. This cyclic relationship is symbiotic.

Even though a continuing rise in numbers of majors is expected, it must be pointed out that the present annual number of graduates already compares favorably with many A.C.S. accredited institutions. Table 5 lists the number of B.S. Chemistry graduates from Glassboro State College and several A.C.S. accredited institutions in academic year 1973-74, the most recent data available. Thus the second point raised by the A.C.S. Committee on Professional Training seems to be contradicted by the data of Table 5. (See page 15).

The third reason cited by the A.C.S. in their denial of our accreditation is that teaching load levels must be arranged so as to permit a research effort on the part of the Chemistry faculty. This point was also stressed by Dr. William J. Bailey who visited with us on March 2, 1976 under the auspices of the A.C.S. College Chemistry Consultants Service. He pointed out that twelve contact hours per semester is a normal faculty load for schools of our type, but that normally one full hour load time is given for each hour of contact time in the laboratory; whereas, Glassboro State College only allows two-thirds of an hour load for each hour of laboratory time. This unusual system results in an effective load of approximately fourteen contact hours for G.S.C. Chemistry faculty. As early as 1968 Pollack (1) pointed out,

"Teaching loads for the Chemistry faculty must take into account the importance of laboratory courses as well as individual instruction to advanced students. It is strongly recommended that calculation of the teaching load in chemistry equilibrate laboratory instruction with lecture time on a 1:1 basis, and that time given to individual instruction as well as research supervision for graduate or advanced undergraduate students be taken into account in computing the teaching load. A maximum of nine hours of contact time for chemistry faculty would be a reasonable teaching load that would allow time for professional growth of staff members."

This position was further supported by Darland (2) in 1968 who stated,

"Faculty members in the sciences should have some reduction in their teaching loads."

(1) Report of the Committee on Science and Mathematics in the State College of New Jersey, H. O. Pollack, Chairman, September, 1968.

(2) Raymond W. Darland, Report on the Science Department at Glassboro State College, 1968.

Table 1. Numbers of B.S. Chemistry graduates from G.S.C. and several A.C.S. accredited schools, 1971-74 (1)

<u>School</u>	<u>No. B. S. Graduates</u>	<u>Highest Chemistry degree conferred</u>
Bloomburg State College	0	B.S.
Columbia University	8	Ph.D.
Drew University	7	B.S.
Drake University	3	B.S.
Hofstra University	5	B.S.
Ithaca College	6	B.S.
Loyola University (New Orleans)	3	Ph.D.
Ohio Northern University University	2	B.S.
Pace University	5	B.S.
Randolph-Macon College	4	B.S.
Rider College	6	B.S.
St. Johns University	7	Ph.D.
Swarthmore College	5	B.S.
Wesleyan College	7	M.S.
Virginia Military Institute	7	B.S.
Washington and Lee University	7	B.S.
Whittier College	2	M.S.
Yale University	14	Ph.D.
Glassboro State College	5	B.S.
Average of all 196 A.C.S. accredited schools offering a B.S. as the highest degree.	5	
Average of Glassboro State College's three classes of chemistry graduates.	7	

(1) Chemical and Engineering News, April 28, 1975, p. 27.

A further contributing factor to the minimal amount of published research is evident from Table 2. In the last six years we have instituted twenty new courses. This has necessitated large amounts of staff time and effort for their development. While further development of new courses will undoubtedly occur, certainly the rate of expansion will never again be this great. Hopefully, the reduction of time consumed in the development of new courses may permit increased faculty research productivity. More importantly, this possibility could be greatly enhanced if the need for such activity were recognized and faculty release time from teaching loads for research were granted.

In spite of these constraints, however, research in Chemistry has been completed at G.S.C. Table 6 (page 17) lists titles of some of these research projects.

Future Prospects

The chemistry program at Glassboro State College has attained a level of quality in its few years of existence that is remarkable in view of the low esteem in which science has been viewed by the public during this period. The changing public climate in this respect was recently assessed by past president of the American Association for the Advancement of Science, Margaret Mead (1) as follows: "Resentment against science among students and the public generally is easing, and the government attitude toward basic science is more favorable." This point has also been noted by new AAAS President, William D. McElroy, who, according to Science News (2), "sensed what he terms a 'healthy turnabout' in people's attitudes toward the importance of science and technology. He sees this attitude reflected in the mood of students on campuses, and in the President's new budget, which proposes major increases for basic research." Much of the previous resentment of science has focused on the physical sciences, and has led

(1) Science, March 5, 1976, p. 927.

(2) Science News, February 28, 1976, p. 134.

Table 6. Titles of Chemistry Research Projects at G.S.C.

1. Column Chromatography Separation of Aromatic Compounds via Charge Transfer Complexing.
2. Separation of Aromatic and Alicyclic Compounds Utilizing Charge Transfer Complexing, Cross-linked Polystyrene Resin.
3. Preparation of Dimethylamine Tetrafluorophosphorane and its Reactions with Boron Trihalides.
4. Analysis of a Three Component-Two Phase System by Gas Chromatography.
5. Development of an Experiment Utilizing Vapor Pressure Thermometry.
6. Deuteration of CH_3X Molecules from Deuterium Oxide via Dimethyl Sulfoxide Complex Intermediates.
7. Demonstration of Practicability of Preparing Acetate Ion from Fused Alkali and Acetylene.
8. A Preconcentration Technique for Polarographic Analysis of Lead in Natural Waters.
9. Preparation of a Series of Unsymmetrical Cyclic Aldehyde Cotrimers.
10. Reactions of Unsymmetrical Cyclic Aldehyde Cotrimers.

a situation in which, as Harold Schmeck (1) notes, "Today educators and manpower specialists foresee a general glut of biologists and a shortage of engineers and, perhaps, physical scientists."

The National Science Foundation reports (2) that most science jobs in the United States are concentrated on the Eastern seaboard, and twenty percent of all of them are located in the Middle Atlantic States.

Glassboro State College, lying in the center of this region, cannot afford to turn its back on its obligation to provide competent technically trained personnel to meet these manpower needs. This is even more vital in view of the prospects for development of off-shore drilling with its attendant increase in related chemical industry, and also a proposed new medical center in Camden.

The primary role of the Chemistry program at Glassboro State College (as is the case at all colleges and universities) has been to function as a service to the non-chemistry major who may need science courses for a variety of reasons. As G.S.C. continues to emphasize the Liberal Arts and Sciences, this role will inevitably increase. J. Stanley Ahmann, commenting on the recent decline in science knowledge among high school age youngsters, noted (3), ". . . . Our society is becoming more technological and complex. How can average citizens be expected to keep informed about critical social and environmental issues without a basic knowledge of science?" (Emphasis ours). Indeed, how can Glassboro State College allow a Liberal Arts and Science student to graduate without taking any science? We feel it imperative that the education model for L.A.S. reflect the importance of science in today's (and tomorrow's) society, and since the essence of science

(1) Science Digest, March 1976, p. 64.

(2) ibid., p. 68

(3) Chemical and Engineering News,
March 31, 1975, p. 2.

in "the doing", we feel that all Liberal Arts and Science students should be required two semesters of a laboratory science. We are confident that we have much to offer the non-science major.

Recommendations for Future Action

Retention of all chemistry faculty is imperative. If this recommendation is met, the ideas in the succeeding paragraphs for expansion of Glassboro State College's role in the science education of South Jersey become possible. Further, this expected growth may well necessitate the addition of a new faculty member within the next several years.

Plans for future research are contingent upon several factors, some of which have been discussed previously. Release time from faculty teaching load and institutional funding for supplies and equipment is essential. Additional space for research must be made available in Bosshart Hall. Specifically, rooms 304 M and 304 L should be converted to research laboratories. Conversion of Room 316 to an advanced multipurpose laboratory would also permit additional research space while simultaneously serving as a laboratory for advanced courses. The hiring of a stockroom man is a necessity to relieve the faculty of the mundane but very time consuming duties of organizing, inventorying and purchasing equipment and supplies. Enactment of these recommendations would enhance the possibility of obtaining grants from outside agencies for faculty research projects, matching grants for equipment, faculty directed summer research by students, etc.

Public relations should be an ongoing effort for the entire college community. The Chemistry Section plans to continue its program of high school student visitations explained previously. Prior to each semester we also mail to area industries and high schools a listing of night course offerings at G.S.C. in physical science and mathematics. In cooperation with the G.S.C. student

affiliate of the American Chemical Society we hope to institute a program of "Science Nights" wherein we would invite the general public to make use of the equipment and expertise of the Chemistry Section for environmental testing, and other projects and demonstrations of community interest.

For reasons previously stated, we recommend that at least two semesters of a laboratory science be required for all Liberal Arts and Science students.

To better fulfill our service role to all G.S.C. students, several new courses should be implemented over the next few years.

1. Analytical Chemistry for Environmental Studies. This would be a sophomore level course designed for environmental science majors.
2. Chemistry of Foods. This is envisioned as a one semester terminal course (requiring no prerequisite) intended for the non-science major. The Chemistry Section has received inquiries from the Home Economics Department regarding the possible offering of such a course.
3. Radiochemistry. This course would be an upper division course intended primarily for physical science majors, and would include modern radioanalytical techniques such as isotope dilution analysis and activation analysis.
4. The Special Topics course should be expanded to bring in on a rotating basis personnel from local industry as adjunct faculty to offer courses in their respective specialties such as polymer chemistry, catalysis, etc.

Faculty professional growth needs to be encouraged. Attendance at A.C.S. national conventions should be supported to a greater extent. Present travel funds are inadequate to permit regular attendance at national conventions unless they are held nearby. Also funds made available for attendance at A.C.S. sponsored short courses would enable faculty to keep abreast of current developments. Also, the current sabbatical leave policy should be continued.

The Chemistry section of the Physical Science Department of Glassboro State College can move in either of two directions. We can rise to meet the challenge of the future, or we can force the community to look elsewhere for its needs.

Summary of Recommendations for Future Action:

I. Retention of All Chemistry Faculty is Imperative!

II. Research

- A. Release time for faculty research is essential.
- B. Rooms 304 M and 304 L should be converted into research labs.
- C. Room 310 should be converted into a multipurpose laboratory with research space.
- D. A stockroom man should be hired.
- E. Institutional funds for research supplies and equipment should be allocated.
- F. Faculty should give more consideration to directing additional effort toward obtaining outside funding.

III. Public Relations

- A. The program of high school student visitation should be continued.
- B. Mailing of physical science night course offerings to area industries and high schools should be continued.
- C. A series of "Science Nights" for the general public should be instituted.
- D. A more vigorous college-wide effort should be made to publicize G.S.C.'s expanded role in higher education.

IV. Modification of General Education Requirements for Liberal Arts and Science Majors

Two semesters of a laboratory science should be required for all L.A.S. students.

V. Development of New Courses

- A. Analytical Chemistry for Environmental Studies
- B. Chemistry of Foods
- C. Radiochemistry
- D. New titles in Special Topics

VI. Faculty Professional Growth

- A. Attendance at scientific conventions should be adequately funded.
- B. Attendance at A.C.S. short courses should be funded.
- C. Current sabbatical leave policy should be continued.

VII. A.C.S. Accreditation should be sought.

VIII. The above recommendations should be reviewed and revised periodically.