The Geology Department at Harvard: a student study.

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Roger Thomas
Marco Einaudi
Geof Feiss
Phil Goodell
Harry Parker
Doug Rumble
Alan Gibbs
Michelle LaFreniere
Introduction

The stimulus for this study came from the Graduate Committee on Education, a group of students working under the aegis of the Graduate Students Association. The aim of that committee is to promote wide-ranging investigations in a variety of graduate departments. One of our students is on that committee, and undertook to organize a study of the Geology Department.

Since this is a relatively small department, we decided to extend our survey to include both the graduate and undergraduate programs. Accordingly, a committee of six graduate students and two undergraduates was set up. We would stress, at this point, that the impetus for our study did not spring from simmering discontent, but rather from a dispassionate desire to examine the strengths and weaknesses of the department, with a view to its further improvement.

The two reports presented here have been based principally on information gathered through two questionnaires, one for graduates, and one for undergraduates. In addition, we have been able to gather facts and ideas from several members of the faculty and of the administration. Our own discussions have been very significant in the final distillation of this material, and the committee alone is responsible for the ideas expressed here.

We believe our conclusions to be broadly based and representative of the feelings of the students. Out of 51 available graduate students, 47 returned their questionnaires. Of the undergraduates, 18 out of 21 students returned questionnaires. Many of the issues raised have been widely discussed among the students.

In summary, we can draw two general conclusions.

1) While constructive (we hope) criticism is offered in many different areas, no major changes in direction are suggested for the graduate program. By and large the graduate students are contented, even excessively so, and most people feel that this is one of the best integrated departments in the university.
2) Prior to the last three years, there had been very few undergraduate concentrators in geology. Now we have a substantial number. These students have more contact with graduate students and a greater sense of belonging to their department than almost any other group of undergraduates in the university. Nevertheless, the department is simply not oriented towards undergraduates. A major review of the undergraduate program in geology is necessary. Both the faculty and the graduate students must become much more aware of, and interested in, the problems of undergraduate education in geology here at Harvard.
Geology and graduate students
Background of students

The variety of previous experiences of graduate students entering Harvard is the salient feature of this part of our study. Forty-five students attended thirty-eight different undergraduate schools, and almost a quarter of them came from overseas. About a third of the students already had a masters degree, and a similar proportion had spent some time out of university since graduation. Sixty percent of the graduate students in the department are married.

The age structure of the present second-year class is markedly different from those of the first, third, and fourth year groups. These latter classes show median ages of 22, 24 and 25 respectively, each with one or two distinctly older students. In contrast, the ages of the second year class are evenly spread between 23 and 33. The reason for this anomaly has not been ascertained.

It appears that the university's general reputation was nearly as important a factor as the reputation of the department itself, or those of individual faculty members, in attracting students to Harvard. No one cited facilities, collections or libraries as his major motivation for coming here. Three or four students said: "I wanted to see whether Harvard would accept me" in partial explanation of their applications, which again underlines the importance of Harvard's overall prestige.

Courses

Most students considered their preparation adequate for graduate work at Harvard, although nearly all reported some deficiencies amongst which mathematics was prominent. It is generally agreed that the number of courses required for the Ph.D. is about right; however, some feel that it should vary with the individual. Advisory committees have not often presented courses which students considered irrelevant, and the prerequisites for courses are by and large reasonable.

A majority of students feel that lectures and laboratory work are not always as well integrated as they should be.
A lot of the dissatisfaction is directed at professors who rarely, if ever, appear in the laboratory. The most frequent complaint is that too much "busy work" is required in the laboratory. Most students are satisfied with the preparation of the teaching fellows; several specify that the teaching fellow should have previously taken the course. There is an equal division of opinion on whether or not there should be more course field trips. A field course for all first year students touching on all areas of geology (like one at Johns Hopkins) has been suggested. Such a course could play a valuable role in the integration of new students to the department, as well as strengthening the students' general geological backgrounds.

There is a considerable demand for a course in geomorphology, which 12 students specifically mentioned. Courses are also sought after in the following areas: computer and statistical applications to geology, rock mechanics, descriptive ("Garrel's type") geochemistry, and a general seminar for new students.

There is a great deal of criticism of the way in which certain seminars have been run. In particular, more active participation and leadership by the professor is necessary. A more open, rigorous discussion would be encouraged by reading assignments given to the whole group. Student lectures in seminars should be kept rather short, and groups should preferably not be larger than 10 students.

The majority of students have felt sufficiently free to take reading courses, and have found the arrangements reached with faculty members to be satisfactory. About three-quarters of the students think of a reading course as an opportunity to study a topic not covered in formal courses, while the remaining quarter see it in terms of the preparation of orals papers and preliminary thesis work.

All but two students feel that it would be a good idea to introduce a course integrating the laboratory techniques of rock and mineral analysis. Suggestions for the conduct of such a course vary from "informal reading, no credit" to "several faculty members, a host of teaching fellows, and a
full-year, full-time course with laboratory and lecture."

The majority of students are in favour of the introduction of certain professional courses. The following courses (presumably not for credit) were most frequently suggested: computers (16), photography (10), thin-section preparation (6), drafting (3), sample preparation (2), and map and photo interpretation (2).

Almost 60% of the students would do nothing beyond grumbling to other students if they found some aspect of a course unsatisfactory. About 15% would complain to the teaching fellow, and a similar number would talk to the professor in charge of the course. The majority of students would like to be able to talk to the professor directly, but some would prefer to have him apprised of the problem indirectly. We suggest that professors should distribute evaluation questionnaires at the ends of their courses. In general, the feeling seems to be that of the problem is with the content of the course, if it is a matter of opinion; if the problem is with the instructor's approach, nothing can be done about it.

Few students have any specific complaints about undue conflicts in the course schedule. Some feel that too many courses are offered on MWF at 9:00 and 10:00 a.m.

**Grades and exams**

Nearly all students feel that the exams given in the department are more or less relevant to the courses. The two major complaints made are that too many exams tend to be regurgitive rather than creative, and that they are often too long, or time is too short. We would recommend a more flexible approach to exams, with a wide consideration of the various options open to the professor. Open-ended, open-book, and even take-away exams are certainly more often appropriate than their present frequency of occurrence would suggest. Too often identical questions and formats are repeated from year to year, and more imagination is
needed in the difficult task of setting the exams. Some people think that papers have not received the grade weight they deserve in comparison with final exams.

About half of the graduate student body feels that too much emphasis is placed on grades, although some argue that this emphasis is generated more by the students than by the faculty. It has been suggested that financial aid should not be so closely tied to grades. Nearly all students consider a pass-fail grading system to be appropriate for certain kinds of courses. These range from reading courses (i.e., as at present) to all courses. Two students cited good experiences with pass-fail at Johns Hopkins. Pass-fail for graduate students is an issue which should be discussed by the faculty, although we realize that decisions of this kind lie with the faculty of Arts and Sciences.

Language requirement

Two-thirds of the students favour the retention of the two language requirement, as at present. Some feel that a thorough knowledge of one language would be preferable to a superficial acquaintance with two, while others suggest substituting statistics or Fortran for the second language. The majority of students would like to see languages other than French, German and Russian accepted, particularly where a significant body of literature, related to the student's field, exists in another language. The present system of informal language testing is generally considered to be adequate, perhaps with stronger guidelines to improve consistency.

Orals

There seems to be rather general discontent with the present orals system. The great majority of students feel that the system places excessive pressure upon them. Uncertainty is still being voiced about the nature of the
changes made last fall. While many people recognize that failure in orals must largely be blamed on the student concerned, it is widely felt that the orals format and psychological pressure may also play a considerable role. Very few students who have taken orals seem to feel that it was a good test either of their general knowledge of geology or of their ability to write a thesis. There is very little agreement as to what changes would alleviate these difficulties. Some students would feel more at ease if they knew how many professors were coming to their exam, and several have suggested that periodic reviews with the student's advisory committee be incorporated into the evaluation procedure. By and large, the suggestions and disagreements of the students reflect their individual personalities and abilities, and any conceivable system is likely to meet with significant disfavor. We would recommend, however, that the faculty keep this problem under continual review.

**Ph.D. thesis**

It is generally thought that the magnitude of the thesis undertaking is appropriate. In view of the long time taken by some students to complete the Ph.D., we would suggest that students should be encouraged to start work on their theses as early as possible. Students have felt quite free in their choice of thesis topics, and have even commended the lack of pressure from faculty members. A few have been limited by logistical considerations.

The present system of faculty review of thesis drafts is in general adequate, except that it frequently takes much too long. Individual faculty members should do everything they possibly can to speed up this process. A reduction in the numbers of drafts needed might be achieved in some cases by more consultation between students and advisory committees at an early stage.

The financial burden of producing the final draft of the Ph.D. thesis is considerable, and many people feel that
it should be assumed by the department. The greatest need
is for secretarial assistance, and it was suggested that the
department might make drafting and photographic equipment
available. It was also pointed out that the student can do
a certain amount to reduce these expenses himself by studying
the regulations carefully beforehand.

There is no consensus among students as to why some
people do not complete the Ph.D. degree. Most frequently
cited are financial difficulties, lack of dedication, and
disillusionment. Lack of dedication lies entirely with the
student, but disillusionment is harder to evaluate.
Disillusionment results where a student’s expectations are
not matched by his own or an institution’s performance.
Either his expectations may have been too high or misdirected,
or the institution may indeed be deficient, and the two
cannot usually be disentangled. Some students feel that
the Ph.D. program takes too long, and a few reasons for not
completing it may be grouped as distractions. These include
family problems, matrimony, and teaching or other job offers.
It is only fair to add that some students may simply not
be good enough academically.

A.M. degree

A good proportion of the graduate students consider the
Harvard A.M. in geology to be merely a booby prize which
compares unfavourably academically with master’s degrees
given by other universities. The general consensus is that
the A.M. should be stiffened by the introduction of a thesis
or some other form of research project, where it is to be a
terminal degree. A master’s degree thesis should not,
however, be required of Ph.D. candidates. Possibly a
diploma or some other form of recognition could be awarded
for a year of course-work.
Inter-departmental studies

The student body clearly feels free and even encouraged to take courses outside this department, either in other departments or at M.I.T. Most students have not encountered serious difficulties, although two were overcome by the complexity of cross-registration with M.I.T. Two others report problems within Harvard, but flexibility evidently prevails.

Only two students have considered changing disciplines, one to Engineering and Applied Physics, and another to a diverse program which defies classification. Four people are in interdisciplinary programs, two with Biology, and the others with Economics and Geophysics. Many other students take some or many courses in other departments, and there is no complaint against the present opportunities for interdisciplinary studies.

Equipment

When the question of equipment is raised in the department, one concern stands out. There is great dissatisfaction in all subdepartments with the number and quality of petrographic microscopes available to students. Disgust and abuse are particularly focused on the obsolete microscopes used in Min. 151, Min. 152 and Geo. 163, but most advanced students also complain of inadequate microscopes.

The most immediate need is to re-equip the optical mineralogy/petrology laboratory, which might be achieved by the purchase of 12 Leitz SM Pol petrographic microscopes; this would cost about $11,000. There is a less pressing, but still considerable, need for more intermediate grade instruments for graduate students; five such instruments would cost about $10,000. Another top grade research petrographic microscope would cost in excess of $20,000. In summary then, we are faced with a need for perhaps $25,000 worth of new microscopes, which should have
useful lives of about twenty years. Clearly the department's current budget does not allow for this kind of expenditure, although a certain sum should be budgeted each year for the gradual replacement of obsolete equipment. At this time, some other source of funds should be sought for a one-time grant to solve a problem which has built up over many years.

The greatly increased amount of X-ray work being done, particularly in courses, has resulted in a shortage of powder cameras. Some additional powder cameras should probably be purchased, but this problem would be alleviated if all members of the department, students and faculty, would return cameras which they are not immediately using.

Sixteen students report that they have experienced difficulty or excessive delay in obtaining thin or polished sections. This is in no way the fault of Mr. Harold Thompson, and many people have suggested that he should have an assistant. While this would certainly be desirable, a number of other things can be done which would largely solve this problem, as long as the total volume of work remains at the present level.

In the first place, there is the matter of priorities. Frequently a student approaches Mr. Thompson with a rush job, citing a professor's authorization. Mr. Thompson has no way of knowing whose work should really be done first, and perhaps a single faculty member should be appointed to advise both Mr. Thompson and the students as to what work should be done on other than a first-come-first-serve basis. In some cases, Mr. Thompson has completed a rush job which has then not been collected for some weeks; this is inexcusable.

The annual distribution of thin-section work is a major problem, and all routine work should be kept for the summers. In particular, at the beginning of the summer, faculty members should be reminded of this, especially if they may require material to be prepared for courses they are giving the following year.

To a large degree delays in section preparation have arisen from the greatly increased number of pollen...
sections needed for probe work. If this volume is likely to be maintained, a diamond drill should be purchased to cut the necessary circular slices. This would cost $200-$300, and would pay for itself very rapidly in terms of Mr. Thompson's time, since the present rough rounding method is very inefficient; it would also give larger sections. An ultrasonic cleaner, which would cost of the order of $100 would also save a great deal of time. A new, more efficient saw would cost under $100.

Mr. Thompson could also devote more time to making sections if students would cut their own slices; they would then also be sure of getting the desired orientation. Many students say that they would be willing to prepare their own thin-sections, but this would involve a considerable expenditure on additional equipment.

Advisory committee

Graduate students in the department are generally contented with the amount and quality of advice that they are now receiving from their advisory committees. Most students find the members of their committees to be easily accessible. Eighteen students feel, however, that they should have more say in the constitution of their committees; it is perhaps significant that this number is greater than the number of students who have ever changed members of their committees.

Finance

Most of our graduate students have not experienced major financial difficulties. Those who have had difficulties particularly after the first year at Harvard. Thesis research funds have been found adequate by most who have needed them. Some field geologists have complained that summer scholarships do not sufficiently provide for the travel and housing of their families.
The brevity of this section of our report surely attests the success of the department's democratic approach to financial aid.

Research and Teaching Fellowships

There are two ways of looking at teaching and research assistantships. They may be considered either as a form of financial aid and a part of the graduate educational process; or they may be regarded, like any other job, as services rendered in expectation of financial reward. Since both of these elements enter, in varying proportions, into every individual's evaluation of his experience, opinions about remuneration and conditions are difficult to interpret.

A striking anomaly in the present situation is the large overlap in hours worked between half-time and quarter-time teaching and research assistants. Eight half-time assistants work an average of 18 hrs./week, while fifteen quarter-time assistants work 14 hrs./week. The ranges within each category are also very large: 10-35 hours/week and 4-20 hours/week. Clearly, it would not be possible, or perhaps even desirable, to exactly standardize these work-loads. On the other hand, assistantships should periodically be reviewed, and the grosser anomalies ironed out.

With regard to the amount of work actually done, 61% of assistants feel that their salaries are adequate; while 39% feel that they are more or less underpaid. Only two students feel that their work is not a useful and rewarding experience. Three-quarters of the students get sufficient guidance from sponsoring faculty members in the conduct of their work, and feel that their suggestions are well received.
Very few students answering our questionnaire felt that the departmental administration is not organized as well as can be expected. There are a number of minor complaints to the effect that it is sometimes difficult to purchase equipment. No other specific complaints were leveled, and the overwhelming opinion is favourable.

Despite obvious limitations on office space for students, surprisingly few students consider their present allocations inadequate. Only five people expressed any dissatisfaction, four of them first year students.

In contrast, only one student is satisfied with the departmental Xerox service, while the complaints of the majority are extremely vehement. Many students feel that the machine has been installed only for the convenience of the faculty, and that student use is being deliberately discouraged. Specifically, nearly everyone complains of the high cost (which some see as subsidising the faculty and the department), and of the inaccessibility of the machine. We have one report that of eight university Xerox machines only one apart from that in Geology is not run on a self-service basis. We feel that a smaller charge and easier access to the machine would result in a vastly greater and more economical turn-over.

The opinion of students is rather evenly divided on the adequacy or otherwise of the library facilities. This may result from the fact that, while much remains to be done, the library is infinitely better organized than it used to be. Some people have asked that theses be made more readily available, and that the rules governing reserve books be strictly enforced. The disappearance of books from the library continues to be a serious problem. A number of students feel that the library is often not as quiet as it could be.
Students and faculty

Asked to rate the quality of the relationship between faculty and students in the department on a scale from 1 (bad) to 5 (excellent), the students came up with a mean rating of 4, with only three people giving less than 3. This speaks for itself. Reasons given for this good relationship are very varied, and include the small size of the department; low student-faculty ratio; accessibility of the faculty, especially junior faculty; facilities such as Horfman Lounge; the geology Club; frequent social activities; mutual respect combined with informality. The only discordant opinions suggest that faculty members may be too busy with research to be sociable, or that they may not wish to fraternize with people whom they must judge.

Of special interest is a frequently voiced suggestion that there is something particular about the nature of people in geology, for which phenomenon Dr. Goodell has coined the term "geomystique". Geologists, it would seem, are fundamentally sociable people.

The great majority of students find the faculty approachable and sympathetic to students' ideas, although usually with some qualification. Much of course, depends on the individual, but the students find the junior faculty particularly receptive, which is not very surprising.

Students

An overwhelming majority of the men in the sophomore do not feel that they are discriminated against by the more dominant males. Perhaps it is to be considered that they enjoy their privileged position.

Very few graduate students have any comments or suggestions regarding the undergraduate program. We are led to suspect that they do not know enough, or possibly even care much, about it. One graduate student does express concern that an undergraduate can take only a course in any one major, even though it may help him in the discipline of
others feel that they should be encouraged to take a wide range of courses. With the much increased number of geology majors that we now have, there is a definite need for some new imaginative courses aimed specifically at undergraduates, as opposed to lower level make-up courses for graduates. Contacts between graduates and undergraduates should be fostered whenever possible, and joint field-trips might be valuable. The Geology Club already provides an important liaison here.

Students were asked for suggestions as to additional activities to be undertaken by the Geology Club. More lectures and particularly field-trips are demanded by a considerable number of people. Also suggested are more help and guidance for new students, tours to local research companies, and the purchase of sports equipment. Less conventional activities were requested by special interest groups; these include metal working, love-ins, beer-making, social reform, polo, and world brotherhood. The Club should do some real research, and find a saint whose day falls in March. Finally, the most ambitious suggestion is that the Geology Club should assume responsibility for the defunct Mohole Project.

The success of the Geology Club is attributed to many of the same causes as the good student-faculty relationship that we enjoy. We may again draw attention to the importance of the geomystique, defined above. Hoffman Lounge, social activities, liquidus and the small department receive most of the credit, but we would particularly draw attention to the enthusiastic work done by the executives.

Harvard and other universities

Few students were prepared or able to compare Harvard with other universities. This question came at the end of our excessively long questionnaire, and they may indeed by then have been too tired to rise to anything more than platitudes.

Harvard is commended for freedom and creative thinking.
for flexibility and theoretical work. The number of faculty
members is favourably noted. Some people regret the lack of
research team-work and practical aspects of geology. Others
deplore the amount of work required, and the length of time
needed to get a Ph.D. Here, as often elsewhere, we find
that congratulations and complaints are directed at the same
features of the department. This is a symptom not of dis-
content, but of a healthy diversity amongst our members.
Geology and Undergraduates
Introduction

Many undergraduates in the department intend to pursue careers in geology, while others take geology out of general interest, as part of a liberal education. The department should aim to provide a program flexible enough to cater for the needs of its diverse members. Criticisms of undergraduate education in geology at Harvard focus on a certain lack of coherence or integration in the curriculum. We have concluded that a broad revision of the program is necessary. We, therefore, recommend that a joint student-faculty committee be established to review the curriculum and make recommendations to the faculty. It might be comprised of three faculty members, three undergraduates, and one graduate student.

Geology has a very high reputation in the University as an undergraduate major, generated by the general vitality of the department and the success of Nat. Sci. 10. We need an intellectually challenging program to maintain the initial interest of incoming students.
Background of students

There are twenty-one undergraduates at present majoring in geology. Seven out of ten seniors participated in the survey, as well as all six juniors and all five sophomores. Six of these students definitely intend to pursue a career in geology, while eight others are contemplating such a course. Two intend to go to medical school when they graduate, and two are majoring in geology out of general interest.

Most undergraduates find that they are sufficiently prepared in the sciences to embark on a program in geology at Harvard. Nevertheless, a significant proportion of students have to take elementary courses in chemistry, physics or mathematics.

Courses

Most students feel that the prerequisites for courses in the geology department are appropriate. In some cases prerequisites might take the form of demonstrated competence in a necessary field rather than completion of a specific course. Many students feel that a brief review of prerequisite material should be presented at the beginning of each course, perhaps by the section man; this would not only refresh some students' memories, but would also clarify exactly what is required. Students find an outline of the whole course, either given in the first lecture or as a printed schedule, to be very useful.

Lectures and labs are sometimes not thought to be as well integrated as they could be. Formal lectures may not even be necessary in courses where theoretical material is not presented, and might be replaced by short lectures in the laboratory. This principally applies to courses in laboratory and field techniques. Basic techniques should be clearly demonstrated to all of the students in the laboratory; they should then be directed to apply these techniques themselves to a wide range of material. Where possible students should be given the opportunity to discover principles
for themselves, but they should not be left without guidance, and the professor or section-man should later draw together the relevant material in a final synthesis. Discussion between students in the laboratory is often very valuable, and should not usually be discouraged.

Additional voluntary week-end field-trips would add to several courses given in the department, particularly Min. 102 and Geo. 151; the examination of minerals and fossils as commonly preserved in situ would make an educational contrast with the selected specimens usually seen in the laboratory. There is also a demand for more afternoon field-trips.

There is a great need for intermediate level courses in a variety of fields designed specifically for undergraduates. Such courses would not only allow students a wider range of choices; they would enable students to gain a broader background across the field of geology. Some such courses are already available, but others might be added in fields such as structural geology, paleontology, marine geology, geomorphology and theoretical petrology. Nearly all students consider Nat. Sci. 10 to be the most influential course they have taken, and its success suggests that some of the methods applied there might be used in these courses. It is surely significant that Geo. 111 and Min. 102 are considered the most valuable courses in the department, in that they are those courses most directed towards undergraduates. Like the graduate students, most undergraduates approve HVAL helping to implement the idea of a single course uniting the techniques of rock and mineral analysis. A single course, however, would not satisfy the needs of both groups, and a course should be devised specifically with undergraduates in mind.

**Grades and exams**

Where possible, the grade for a course should not depend entirely on the results of a single exam. Hour exams, quizzes, lab. reports and papers should also be taken into account. Professors should particularly note discrepancies between course-work and exam results. Nearly all students are in favour of pass-fail, at least for some kinds of courses. It
is thought to be particularly appropriate for small courses, but some would like to extend it to all courses.

**B.A. program**

Nearly all the students feel that the number of courses required for the B.A. is about right. We would favour requirements in related fields which prescribed the fields themselves, leaving some choice, rather than specific courses. About three-quarters of the students are in honors, largely because they want to write a thesis, but also on account of the extra prestige. Those who are not in honors do not have high enough grades or do not wish to write a thesis.

Students who have been to field camp have found it very valuable, and this is clearly the best way for undergraduates to gain field experience. In addition to seeing rocks and structures in real life, it is stimulating to work with new faculty and students. Some undergraduates would like to see Harvard run its own field camp, partly because they have had difficulty getting into other over-subscribed camps. A course taken during the academic year is a very poor substitute for field camp for both geographical and logistical reasons. Two or three students have wanted to work as field assistants for two summers instead of going to field camp because of the expense and resulting inability to earn a salary during the summer.

We find sophomore tutorial exciting and a good follow-up to Nat. Sci. 10. Students feel that it is an opportunity to examine a wide variety of concepts in geology, many of which are not covered in formal courses. Juniors continue to find sophomore tutorial valuable, and no separate junior tutorial is necessary, as long as the material of sophomore tutorial changes from year to year. The juniors would like to go on a different set of field trips in the second year — i.e., sophomore tutorial should offer different field trips in alternate years.
Several students writing, or intending to write, a thesis think of it in terms of research. To most, however, it is largely a chance to learn how to tackle a geological problem, and to present the results. It is felt that it is the thesis that makes the difference between honors and an ordinary degree, since most students take the courses required for honors anyway.

**Advisors**

Undergraduates find their advisors very accessible and potentially very helpful. However, most students have little occasion to see their advisors since they take most day to day problems to Steve Norton, in his capacity as tutor to undergraduates. In contrast, students in the senior year, particularly those writing theses, find their advisors invaluable. We find the close contact with graduate students a constant source of information, advice and encouragement.

**Equipment**

Like the graduate students, we have found the petrographic microscopes used in the laboratory to be quite inadequate for the work we have been assigned. A solution to this problem, which we welcome, has been presented in the graduate student report.

Keys to the building are generally available to students who can justify a need for them, but some have in fact had difficulty getting them. We suggest that the undergraduate tutor should be responsible for authorizing the issue of keys to undergraduates. Keys are essential to undergraduates taking laboratory courses, and also for them to get into evening tutorials and other meetings. Most students also need keys to the library, since the hours when the library is open largely coincide with the hours they spend in class. The library is also closed at lunchtime, when many undergraduates would most conveniently be able to use it.

We recognize the shortage of office space in the
department, but need a place to study and keep books and materials. Until the stairwell is remodelled, we would like to use part of the large spider-filled room in the basement. We are prepared to clean out part of this room, and use it as it is, if this is acceptable to the department.

Undergraduate interest would be stimulated by greater exposure to the advanced equipment and techniques being employed in the department. This would lead to a greater awareness on the part of the students of what modern geology is all about.

Students and Faculty

As told to evaluate the quality of the student-faculty relationship in the department on a scale from 0 (bad) to 5 (good), the undergraduates gave an average rating of 4.4. This reflects the much closer contact between students and faculty in this department than most others. However, the undergraduates are less inclined than they should be to constructively criticize the way courses are run. Although they find the faculty approachable as a source of EMS advice and information, they do not expect the faculty to be receptive to their ideas. Closer collaboration between students and faculty on the design of courses is vital in maintaining the enthusiasm and intellectual excitement generated in incoming students by Nat. Sci. 10.

Students

The legendary quality of life enjoyed by its members draws undergraduates to the geology department. The small size and informality of the department combined with the physical advantages of Hoffman Lounge are principally responsible for this state of affairs. The Geology Club plays a major role in bringing together faculty, graduate students and undergraduates.