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REVIEW AND EVALUATION OF THE DEPARTMENT OF GEOLOGICAL SCIENCES,
STATE UNIVERSITY OF NEW YORK, ALBANY

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This report derives from a review of written materials supplied by SUNY Albany, including an internal department review; a site visit on 22, 23 February during which we spoke with faculty, graduate students, undergraduate students, a technician, and members of the University administration; and subsequent discussion between us concerning our impressions.

We thank all the members of the Department - faculty, students, and other staff, as well as the University administrators for their helpfulness, cooperation, and positive response, which made our visit a pleasure.

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ASSESSMENT OF DEPARTMENT OF GEOLOGICAL SCIENCES, SUNY ALBANY

Perspective

Before discussing the Department of Geological Sciences, we feel it appropriate to comment on the direction that the geological sciences will take in the next decade. It is in that context that we will then comment on the future plans of the Department.

First and foremost, there will continue to be a need for well-trained top quality earth scientists. Such training includes not only the basic earth sciences, but also as much mathematics, chemistry, and physics as can be accomodated in both the undergraduate and graduate programs. A direction for the 1980's is emerging which emphasizes the geology of the continents and their margins. An example of this is that the international program for the 1970's was called "geodynamics", but this has been refocussed for the 1980's and is now called "International Program on Dynamics and Evolution of the Lithosphere- the Framework of Earth Resources and Reduction of Hazards". The title reflects the change in direction of the earth sciences along with a greater interest in the needs of society. This trend is reflected internationally, as well as in this country.

We feel that any department capable of addressing the problems of the 1980's and beyond should have several important characteristics. The first is a sound curriculum both at the undergraduate and graduate levels. Second, it should be engaged in important research activities which will contribute to the understanding of the earth, and be cognizant of the trends that the science is taking. Additionally, it should keep current with the major progress and contributions of others in the field; and be in reasonable contact beyond the university, with an involvement in community service locally, nationally, and internationally.

Department of Geological Sciences

The Department of Geological Sciences at the State University of New York at Albany is a medium-sized department, but one which has a critical mass of both faculty and students so as to be viable in teaching and research. Two approaches can be taken in a department of this size. One is to develop a faculty which covers most of the sub-fields within the earth sciences. The other is to specialize in one or a very few areas. This Department has opted for the latter approach, and has been very successful at it.

The Department has acquired what we consider is an outstanding faculty, which is well-known for its research efforts. It has attained a fine international reputation, and is attracting excellent graduate students in specialized fields. The faculty have an international scope in both their teaching and research. The Department has a reasonable balance between graduate students and undergraduate majors. Further, there is a good mix, at present, between faculty whose focus is mainly on research and graduate teaching, and faculty whose focus is principally on the undergraduate teaching level. This mix, however, will change shortly with the retirement of Peter Benedict, and every effort should be made to retain this position for the Department.

It cannot be emphasized enough that with a department of this size, the number of faculty currently in the department must be maintained in order to maintain the overall success which they have had in the past. It is our opinion that this faculty is spread out thinly in terms of the research and teaching demands it is trying to meet. A reduction in staff would create serious problems.

Curriculum

We feel that the Department's curriculum, both graduate and undergraduate is reasonable. It is a very solid curriculum in the areas of earth sciences that the faculty covers. Because of the philosophy to develop two major fields of strength, geochemistry/petrology and tectonics, however, there are some areas which are not covered. These areas include geophysics, stratigraphy, sedimentology, paleontology, economic geology, and planetology.

To cover geophysics adequately, and be able to keep the geophysics faculty, would require a group of two or three. Because this is not a likely event in the near future, it is probably best if no effort is expended in this direction. We are confident that planetology will be worked into the curriculum with the advent of John Delano to the staff. Economic geology could strengthen one of the two existing specialties, but is not as critical a gap as what we consider a significant lack, which is the general area of soft-rock geology. This would include stratigraphy, sedimentology, and paleontology.

Up to now, soft-rock geology has been covered by a part-time appointment, plus the availability of a course at RPI. Our impression is that the RPI course is simply not taken (we know of two students, of those in residence, who have taken it). We feel that this is such an important area, that it is related to the ability of a student to choose an area of specialization in the earth sciences, and affects students' abilities to obtain future employment, that we make the following recommendation: given only one future position to be filled, that it be filled in an area of soft-rock geology which is related to tectonics. This is an obviously important area of research in its own right, but it can be worked into the framework of one of the existing major areas in the Department.

The general soft-rock area is not only important to the petroleum industry, but also in other areas such as waste disposal, environmental planning, ground water, and hydrology. It is because of all these contributions to important societal aspects of earth sciences, as well as being a fundamental part of any earth science curriculum, that we feel this area should receive some integrated coverage, rather than the way it is being treated now. We envision a person whose principal research tools for obtaining the necessary data for the science are in the soft-rock area, but who has interests in tectonic problems and would thus fit well into the existing tectonics group.

The Undergraduate Program

In reviewing the curriculum and talking with undergraduates, we found the Department quite healthy. The undergraduates felt they were getting good instruction, the faculty was very helpful and approachable, and the general atmosphere was good. A few comments might be helpful in improving the undergraduate experience. We have already commented on the need for added and integrated soft-rock instruction. A temporary expedient might be to make a University van available so that students could readily get to the course offered at RPI, particularly if enough students are required to take the course each year. We note that neither this, nor the use of part-time faculty, has the effectiveness of a regular faculty appointment with regular required courses and someone to speak up for this area at faculty meetings.

Another area on which we wish to comment is the communication between undergraduates and the Department. We sense that a small additional effort could make the undergraduates feel more integrated into the Department. We suggest: working them more effectively into graduate student and faculty

research; a more deliberate effort to raise some monies, either from grants or industry or from the University, which could be used to hire and support students in the field or laboratory; make added efforts to find summer or part-time employment for them in local government or industry. The last point would expand their career awareness, something the undergraduates felt they lacked somewhat, as is so often the case.

The Graduate Program

Our review of this program suggests that the graduate students are receiving very good instruction in their courses. The students felt the same. These students were not so worried about the breadth of instruction within the department. This tends to be the case for graduate students, because they have already developed their more restricted interests, a fact that is reflected in their applying to a department which is rather sharply focussed such as this one.

Even though the students felt that their curriculum was adequate, one of the points we would like to stress is the fact that some of these graduate students who go on to teaching may be asked to teach courses in which they have little or no background. This is particularly true where a new assistant professor is hired in a relatively small department. In such cases, it is quite common to expect someone to teach structural geology (for which these students are eminently suited) along with stratigraphy and, possibly, paleontology or sedimentology. Without some serious exposure to these areas, students may find themselves at a disadvantage in the job market. We have already discussed the parallel problem with regard to the petroleum industry.

We noted a few communications problems between graduate students and faculty. The students would greatly benefit from being kept better informed

as to how they are doing individually. Comments from their advisor, or an annual review where they receive an assessment of their progress, or some comparable mechanism might be used. Included in this would be some assessment of their overall development. Another item raised by the students was the need for some type of written handout to the students where the mechanics of the graduate program are spelled out. This could include the sorts of items found in the University catalog concerning degree requirements, dates of important examinations etc., but could also list whom to see about which courses to take, minor administrative matters that are specific to this Department, questions of financial support, etc. This might be handed to students when they first arrive. We noted that students are a bit diffident about going to an assigned advisor because it might imply that they would then be committed to be his students. Spelling this procedure out in such a handout might be a possible solution (perhaps suggesting that the student is assigned a "faculty advisor" pending the selection of a "thesis advisor", and that the student should work out the choice of thesis advisor with all due dispatch). Finally, it would be desirable to give the graduate students a better sense of participation in the Department. This might be effected by permitting them to have representatives at the Department faculty meetings, except for such times as very confidential subjects are discussed. This would let them be current with the issues in the Department and give them a chance to supply the student viewpoints to the faculty prior to the faculty votes on the issues.

We turn now to the overall teaching program, as opposed to courses for geologists. We feel that given the size of the Department, the teaching effort is probably at or near a maximum. In fact, we feel that they are probably stretched rather thin in trying to conduct their research and handle the graduate and undergraduate curriculum.

They are advising the number of graduate students that one would expect, (an average of about four), but we note, however, that there is an unequal distribution of graduate student load. This problem will be addressed further below.

The Department does offer one course (Planet Earth) as a service course for non-majors, and are contributors to a course (The Ocean) shared with two other departments. We feel that given their size and effort toward developing their graduate and undergraduate programs, that any additional teaching of general education courses might detract from their course offerings for majors. Departments of larger size can be expected to team-teach these general education courses with less strain on their curriculum for majors, but we're not sure that this would be the case for the Department of Geological Sciences.

The Department is involved in important community service, such as teaching of high school earth sciences teachers, as well as through direct contact with local high school students. This is an extremely useful and admirable task, because as a rule the earth sciences are very poorly taught, if at all, in high schools. Very few high school graduates know enough about geology to indicate it as a potential major when entering college. Such contact with pre-college teachers and students should produce some fairly significant results.

The Department in Transition

We feel that this review of the Department of Geological Sciences comes at an opportune time. The complexion of the department is changing from what it was during the last decade. The loss of John Dewey and Jeff Fox and the imminent retirement of Peter Benedict, as well as the recent hiring of two new faculty, have changed the complexion of the department considerably.

There are two parts to this change that we would like to address. One, is a transition period in which the Department currently finds itself, and which probably will affect its activities for the next year or two, and the other is the long-term future of the Department as reflected in past and future changes. The greatest impact in the transition period has been in the area of graduate student advising and research, and this will be commented on rather specifically shortly.

We would like to emphasize very strongly that with the retirement of Peter Benedict, the Department faces a critical problem. He has been one of the faculty members most strongly involved in the undergraduate teaching program within the department. In effect, he teaches six semester courses per year. When he retires, it is likely that a new faculty member who would replace him would be more involved in his/her research and with graduate students, and would probably only teach three courses per year. The result would be, effectively, a loss of three courses per year. This is another reason that we feel that the faculty line which becomes available upon Peter Benedict's retirement must be retained within the department. Even with a replacement, they will lose some teaching coverage.

For a department of medium size, this department has achieved an outstanding reputation, but the research effort within the Department is uneven. Of the nine current faculty members within the Department, the research effort has been carried mainly by six or seven members. The contributions of other faculty members are to undergraduate and graduate teaching. This, however, makes for a reasonable balance of faculty effort. Those faculty members involved heavily in research have published widely in national and international journals, and have achieved an outstanding reputation. We are confident that the two new faculty appointments are very strong, and that these people very shortly will add great luster to the research

reputation of the Department. Thus we see a very active and successful research program being carried on by this Department over the next decade. The one point that is worth making is that while the laboratory-based research is definitely increasing within the department, the emphasis on field studies is declining. A more equal balance between field and laboratory research can be achieved in selecting the new faculty appointment.

The department has been successful in developing a well integrated research effort between its two main areas of strength, and for future success this should be continued. While we most strongly recommend the retention of the faculty position upon Peter Benedict's retirement, it is possible that, within the next few years, an additional faculty position might be available. If that is the case, we think that every effort should be made to hire a person who will strengthen this integrated teaching and research effort. An area which could well be considered, and in fact is the one being considered by the Department, is one which bridges the areas of tectonics and geochemistry. A person expert in the properties of geological materials both from the chemical and mechanical aspects would add enormous strength to the existing program in tectonics.

If one can envision two positions available in the future then the two areas which we have mentioned above, 1) soft-rock/tectonics and 2) tectonics/deformation mechanics appear to be by far the strongest directions in which to develop.

Thus we would conclude that the research effort in the department is very strong; it is enhanced by the two new assistant professors added to the department; and should be enhanced by the return of Steve Delong to research and teaching.

The most critical transitional problem which exists within the department, because of the recent changes in faculty, affects the graduate students.

There is an enormous imbalance in the current distribution of students in tectonics, and geochemistry/petrology. More than two-thirds of the students are in tectonics, whereas most of the current faculty are in geochemistry/petrology. As a result, most of the students are advised and directed by two or three faculty members. This has placed an enormous load on these faculty who are carrying six to ten students each. This is clearly far too great a burden for any faculty member, and it is important for them to get some assistance. We feel they need assistance in two areas. One, is to provide some university funding to permit them to travel and supervise the very large number of students who are doing field research, and to help the students pay field expenses. It takes a great amount of time and effort to supervise field research topics adequately. A figure of about eight to ten thousand dollars over the next year or two would permit the faculty to discharge their responsibilities adequately to the students now in residence. In addition, one or two faculty members need more time to advise students. We recommend that some released time be made available from their teaching duties for members who are heavily committed to advising graduate student research. Some of the slack in teaching might be picked up in the curriculum by a temporary appointment who might also help with some of the research advising and supervision. We feel very strongly that this is one of the most critical needs within the department over the next one or two years. The current imbalance is a transitional problem that must be addressed immediately.

The Department can reduce the current imbalance within one or two years by implementing an admissions policy for graduate students that considers carefully the interests of faculty members, their areas of research, the facilities within the Department, and contrasts these with the interests of incoming graduate students. By advertising department strengths, the

Department should receive applications so as to distribute incoming graduate students more equitably amongst the current and future faculty. Some, otherwise worthy, applicants may need to be turned away until the balance has shifted.

Part of the transition problem arises from the success of the Department over the past decade. They have developed into one of the leading departments in the area of tectonics, and because of this past success they have attracted a large number of very capable graduate students in this area. We hope that, with some of the recommendations we have made, this abundance of good students in one area can be moved along successfully through the transition period, and that the department will have the same success in attracting good students, but with a distribution that better reflects faculty strengths in the future.

This transitional period has also led to a few communications problems within the Department. Some graduate students felt that they were left hanging after the departure of John Dewey, and that they were required to make rather drastic adjustments in advisors or even in fields of study. In a few cases, the graduate students felt that they were being pushed in directions that they did not want to go, and had very little input into how these decisions were made. This has led to some feeling of unpleasantness within the Department, but it is something that can be rectified with a more sensitive handling of communications between faculty and graduate students.

Support Facilities

The support facilities within the Department appear to be quite adequate. The Department is reasonably well-equipped both for teaching and research purposes, and the technician support presently is reasonably adequate.

Administrative help above the Departmental level would be useful to make available technician support, such as in electronics, which is not available within the Department. Such support exists in other departments, but is available to Geological Sciences only well after other priorities are met. If these support staff are paid by SUNY, their priorities might be changed somewhat so as to help Geological Sciences without significant changes in total payroll.

The library facilties look quite adequate. What was not available on campus could be obtained from RPI, which has an excellent engineering and materials library, or through the operating inter-library loan system.

Computer support for the Department also seems sufficient. There may be increasing computer needs throughout the Department over the next decade, but that is not now a problem. The Department's space requirements indicate that while they may be somewhat crowded, there doesn't seem to be over-crowding. This might change, however, depending upon the area in which a new faculty member might be hired, particularly if she or he has a strong laboratory orientation.

Recommendations

Based on the materials we received, discussions at SUNY Albany, and our own observations, we recommend the following:

1. The Department must retain the position which will be vacated upon the retirement of Peter Benedict. We suggest that that position be filled by someone in soft-rock/tectonics, preferably with a field orientation. If a second line were to become available in the next few years, the addition of someone in the study of materials and its application to rock deformation would be appropriate and in keeping with the Departmental philosophy of two strong areas being characteristic of the Department of Geological Sciences.

2. We recommend that the Department receive assistance through the University to help them through their critical transition period of the next year or two. We suggest that this aid come in several possible forms. First is clearly some financial support for supervision of graduate student research. We recommend the sum of eight to ten thousand dollars to help with the faculty and student expenses required for supervision and completion of graduate field studies and theses. Second, some time may be made available by reducing teaching loads of the faculty most heavily involved (Kidd, in particular) in supervising the graduate student research in the area of tectonics. This might be accomplished by reducing the teaching load for those faculty members involved and the addition of a part-time or visiting faculty member to help both with the teaching, and the advising and supervision of this research.

3. We recommend that the admissions procedure for incoming graduate students be organized in such a way that the distribution and interests of incoming graduate students reflect the interests of faculty research, faculty strengths, and time available for supervision and advising. Perhaps advertisements from the Department to departments around the country informing them of changes in strength and direction might help.

4. We would recommend an increase in the effort by the faculty to raise research money with a particular emphasis on graduate student support. The inclusion of undergraduates in various capacities could also be considered. Additionally, some attempts at acquiring industrial support might be pursued, although this tends to be less successful than support from federal funding agencies.

5. We recommend that technical assistance, which the Department currently has, be continued at least at the present level, and that university assistance be provided to assure that access to adequate and timely additional technical help outside the department be facilitated.

6. We recommend that the faculty facilitate an increase in the involvement of graduate students in certain Departmental discussions and decisions, particularly those that affect the students directly. Although the faculty would still make the final decisions on such matters, a more sensitive

handling should improve the overall climate in the Department. To a lesser degree, the same can be said concerning the Department's relations with the undergraduates.

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