

the external world, has, for want of the poetical faculty, proportionately circumscribed those of the internal world; and man, having enslaved the elements, remains himself a slave.

Lest you think that Shelley is not sensitive to the role of technology in modern society, let me quote what he has said in that connection:

Undoubtedly the promoters of utility, in this limited sense, have their appointed office in society. They follow the footsteps of poets, and copy the sketches of their creations into the book of common life. They make space, and give time.

Shelley's *A Defence of Poetry* from which I have just quoted is one of the most moving documents in all of English literature. W. B. Yeats has called it "the profoundest essay on the foundation of poetry in the English language." The essay should be read in its entirety; but allow me to read a selection:

Poetry is the record of the best and happiest moments of the happiest and best minds.

Poetry thus makes immortal all that is best and most beautiful in the world . . . arrests the vanishing apparitions which haunt the interlunations of life . . .

Poetry is indeed something divine. It is at once the centre and circumference of knowledge; it is that which comprehends all science and to

which all science must be referred. It is at the same time the root and blossom of all other systems of thought.

Poets are the hierophants of an unapprehended inspiration; the mirrors of the gigantic shadows which futurity casts upon the present; the words which express what they understand not; the trumpets which sing to battle, and feel not what they inspire; the influence which moves not, but moves. Poets are the unacknowledged legislators of the world.

On reading Shelley's *A Defence of Poetry*, the question insistently occurs why there is no similar *A Defence of Science* written by a scientist of equal endowment. Perhaps in raising this question I have, in part, suggested an answer to the one I have repeatedly asked during the lecture.

I began this lecture by asking your forbearance for addressing myself to matters which are largely outside the circumference of my comprehension. Allow me then to conclude by quoting from Shakespeare's epilogue to the second part of his *Henry IV*:

First, my fear; then my curtsy; last my speech.
My fear, is your displeasure, my curtsy, my duty, and my speech, to beg your pardon.

S. Chandrasekhar is the Morton D. Hull Distinguished Service Professor in the Departments of Astronomy and Astrophysics, Physics, the Enrico Fermi Institute, and the Committee on the Conceptual Foundations of Science.

REPORT OF THE VISITING COMMITTEE TO EVALUATE THE DEPARTMENT OF ANATOMY

I. Background

The Evaluation Committee was charged originally with the task of reviewing programs and organization in the areas of anatomy, cell biology, evolutionary biology, and neurobiology. As we anticipated our task by reading materials sent us, and refined it through discussions with members of the University's faculty and administration, our attention came to focus more specifically upon the Department of Anatomy itself, and upon the ways in which it interacts with other units in the Division.

In two-and-a-half days at The University of Chicago, we interviewed junior and senior faculty in the Department by disciplinary groups and—in seven cases—individually, at the faculty member's request. We also saw, singly or in groups, nearly all of the Department's graduate students. We met with the other department chairmen in the basic medical sciences, with the Master of Biology and the Dean of the College, with the Acting Chairman of the curriculum committee in The Pritzker School of Medicine, and with administrative officials of the School and the University. We also held discussions with groups of faculty concerned with graduate training in neurobiology, cell biology, and evolutionary biology. Finally, we were shown the facilities of the Department of Anatomy and talked with its Chairman. Such interviews by the full Committee occupied about twenty-four hours of our visit, and we spent an additional six hours in executive session.

None of us is confident that a single experience, however concentrated, can reveal all the details of a complete system, nor that our responses are the most appropriate ones possible. Still, we were impressed with the consistency of the patterns that emerged from these interviews, and at the congruence of the views each of us came to hold as a result.

II. History

We would register, to begin with, our very positive view of The University of Chicago's contemporary devotion to its traditional ideal that academic excellence dominates all other consid-

erations in appointments. This freedom from constraint in the appointment process extends into the area of practice: no institution known to us affords its faculty members more independence from particular formal assignments related to their specialties. Partly as a result, Chicago has a tradition of developing strong programs in important areas not necessarily popular elsewhere.

The Department of Anatomy provides a good example of this kind of building. At the time its present Chairman assumed office the Department was at a low ebb in numbers, productivity, morale, and facilities. During the intervening decade, its climb to effective status has been impressive. Especially conspicuous among its achievements has been the recruitment of a group of functional morphologists that has become nationally known for its research accomplishments, and for a strong teaching program in gross anatomy. The Department is a training center for graduate students who become effective teachers of anatomy, as well as researchers in functional morphology, so much so that the Department has become the main national supplier of biologists in this discipline. Facilities in the Department have been thoroughly modernized, despite their location in antiquated space. There is conspicuous interest in, and dedication to, effective teaching. In these ways the Department clearly bears the stamp of good management.

III. Present Views of the Department of Anatomy

Despite these achievements, there is evident malaise both inside and outside the Department. Some faculty members voice objections to the managerial style of the Chairman; we heard similar complaints from some members of other faculties within the Division, and from one or two members of the administration. We found it difficult, however, to evaluate the few specific points raised by departmental faculty to illustrate these concerns. In the end, we had to attribute most of them to differences of style or personality, or to polarizations of attitude rooted primarily in events outside the realm of academic policy.

Two of the complaints voiced to us on several occasions seem to possess more substance. The

first is related to the tripartite organization of the Department. Three foci of strength: Functional Morphology, Neuroanatomy, and Cell Biology are represented, and organized as sections in the performance of some of the Department's work. The specific complaint to which we refer here concerns the use of the sections in preliminary screening of departmental appointments.

It has become the practice to accomplish much of the selection process at the sectional level, involving the rest of the Department only in the final evaluation of candidates during visits and in the final selection. In the most recent appointments, some feel that even these final requirements for broad participation were only minimally met. It is our belief that failure to guarantee wide involvement in the appointment process from the beginning is a serious procedural defect, primarily because it encourages inbreeding, but also because it invites dissatisfaction with the results.

The second kind of complaint had to do with alleged arbitrariness on the part of the Chairman in dealing with various aspects of graduate training, including the allocation of support. These were often not very specific, but at the very least the variety of perceptions on the part of faculty and graduate students about this matter suggests significant deficiencies in communication between the Chairman and both constituencies.

Do these findings lead to the conclusion that there has been serious disenfranchisement of any group within the Department of Anatomy? We think not. Junior faculty, in particular, seem to play an active role in the determination of policy and in the appointment process. Opportunities for participation seem available; the fact that participation has been so variable speaks more, we believe, to differences in individual motivation than it does to the availability of opportunity. In fact, it can be argued that democracy in the Department may have been extended into areas where it may produce an unfortunate impact. We know of no examples, in other institutions, of participation by non-tenured faculty in votes on internal promotion to tenure. In general this practice is avoided because it can throw junior faculty into conflict of interest—or at least into a situation in which such a conflict could be perceived by others. At a time when economic realities make it increasingly difficult to cross the tenure line, such a policy may become increasingly troublesome.

Before leaving this part of the problem, we think it important to illustrate the degree to which misperceptions are contributing to the present

dissatisfactions within the Department. Several faculty members expressed the suspicion that the Chairman did not vigorously support, in higher levels in the University, proposals for which there was a departmental consensus. They cited a specific instance, in which he is believed by some not to have been sufficiently warm in his support of a departmental vote for the promotion of a faculty member. Ironically, we received from some administrators a complaint, based upon the same incident, that the Chairman was in this instance *too* vigorous, and that the institution had nearly been forced into an error by the strength of his support for the departmental position. There may be, in this incident, some cause for criticizing the Chairman; but, if there is, it would be for actions *opposite* to those for which departmental critics have held him responsible. We believe that a substantial improvement in the present morale of the Department of Anatomy could result from a simple resolution of these misunderstandings.

Proposals for Reorganization

As one potential solution to problems within the Department of Anatomy, the Committee carefully considered an existing proposal to divide the Department and distribute its faculty to the Department of Biology and/or the Department of Pharmacological and Physiological Sciences. *In our view, this proposal involves a structural disruption entirely disproportionate to the problem.* Whenever such departmental realignments are considered, two questions must be asked: First, what evidence is there that the relocated elements will be welcomed in their new environments or that the new associations will represent their disciplines more effectively? Second, are there alternative structures that can realize the benefits of reorganization, if any, without the costs?

With regard to the first, we are unable to identify *any* willing receptacle for the fragments resulting from Anatomy reorganization. The members of the Department of Biology to whom we talked almost unanimously expressed lack of interest in adding either the cell biology group or the large contingent of evolutionary morphologists. We find their reasons persuasive. The Biology Department, with 25 faculty, is about at the limit of size for effective interaction, and has evolved a balance of disciplines which it is reluctant to disrupt. The functional morphology group is large enough to alter that balance considerably; the cell biology group does not, at its present strength, represent a particularly logical or desirable addition. No other departments seem ap-

propriate locations for either of these units. The Department of Pharmacological and Physiological Sciences is in some respects a plausible home for the neuroanatomists, but for reasons given below we favor an alternative arrangement in which the neurosciences develop in several locations.

Concerning alternative structures, we re-emphasize the flexibility of arrangements at Chicago for graduate education and for inter-departmental cooperation in other ventures. The mechanism of joint appointment has already been used to link the Department of Anatomy with the various departments that would absorb it under the dispersion proposal. The Committee mechanism for graduate training is already available for Evolutionary Biology and for Cell Biology. We can identify in the proposed reorganization no educational purpose that cannot be satisfied through less drastic and costly arrangements.

Impacts upon Teaching

The most compelling argument against the reorganization proposal has to do with its potential impact upon teaching programs, especially those for medical students. We believe that this matter is important enough to deserve special attention, since it should figure importantly in other decisions about the future of the basic medical sciences. The University of Chicago expresses as its goal in medical education the training of innovative practitioners and, in particular, persons destined for careers in academic medicine. In support of these goals, the University offers a traditional faculty appointment policy of excellence without regard to teaching specialty, and a curriculum in which emphasis is laid upon a scholarly approach to medical science. The organization of the School of Medicine is consonant with these purposes, especially in the unique arrangement that makes the School a part of a Division of Biological Sciences.

In such an organization, the basic medical science departments have a special role. To be sure, they represent particular research disciplines; but in an important sense they are also the main custodians of medical education. In an environment in which many courses are put together from disparate departmental elements, departments like Anatomy are unique sources for the more closely organized instructional efforts required in teaching pre-clinical students of medicine. In short, they develop and nurture the teaching of key courses instead of merely commissioning it. We

do not believe the difference between these two processes is adequately appreciated elsewhere in the Division. In response to questions about the fate of particular elements in the medical school curriculum under some proposed rearrangement, we were repeatedly assured that the teaching would somehow "get done," or even that there were better ways to do it than the present ones. In no case, however, were we offered *specific* programs or solutions, nor even any evidence that extended thought had been devoted to the problem. At present the Department of Anatomy has responsibility for teaching Gross Human Anatomy and for Histology, and plays a major role in the interdisciplinary course in Neurobiology. Compelling intellectual arguments for the redistribution of the Department would have to be brought before we would recommend placing these important academic responsibilities in the uncertain charge of a coalition still to be organized.

The Department of Anatomy and Special Areas

It was a special part of our charge to investigate relationships between the Department of Anatomy and three areas in the Division of Biological Sciences: Cell Biology, Evolutionary Biology, and Neurobiology. In this section we assess the strengths of the Anatomy Department in each area, and briefly evaluate how each might best develop greater strength in the Division as a whole.

Cell Biology. Historically an area of great strength in the Department, cell biology is now under-represented on its faculty; graduate students in this field, as well as faculty, wish it were better developed, and some blame the present circumstance on the Chairman's preference for functional morphology. In our view, other factors are responsible. In the first place, development of cell biology as a specialty in the Department was deliberately deferred for several years, in the mistaken expectation that the nascent Laboratory of Cell Biology would develop that specialty instead. When that failed and appointments did become possible (at the end of the 1960s), some of the expansion opportunities had been lost. Second, the Chairman had to develop new facilities. We find he did this well, local criticisms to the contrary. Third, the age structure of the Department was a deterrent to the making of tenure appointments: two senior faculty members in the area retire in the coming year. Finally, strong representation of cell biology in the Department of Biology made duplication an important problem.

The result of all this has been a group within Anatomy that is not as strong as one would wish, but which can be strengthened in the near future. One of the difficulties in specifying a direction for these improvements lies in the fact that cell biology means different things to different people. There are, in at least six departments at The University of Chicago, faculty members who call themselves cell biologists. In our view the best relationship between cell biology and the rest of Anatomy is to be found nearest the supracellular level—that is, in fields concerned with relations between cellular activities and tissue structure, or with tissue interactions in morphogenesis. Such an appointment strategy would leave Biology with the responsibility for biochemical cytology and subcellular biology.

Neurobiology. The present group of neuroanatomy, after an immediately upcoming retirement, will consist of one senior and two non-tenured faculty members. It must provide essentially all the teaching in neuronal morphology for medical students and for graduate training in related areas, including biopsychology, and must also play a major role in the development of an active interdisciplinary research focus in the neurosciences. It is too small to do the first two, and not distinguished enough to accomplish the latter.

It is important to report here new stirrings that suggest the emergence of neurobiology as a major area of graduate training and scholarship. Although it has had distinguished neurobiologists on its faculty in the past two decades, Chicago has never had organized strength in the discipline. At present there is not even a committee to regulate graduate training. But the realignment of Physiology and Pharmacology, and one or two new appointments, have refreshed the hope that the needed cooperation will emerge.

If these moves are to be successful, new strength in the neuroanatomical sciences will be essential, because much of the current excitement in neurobiology—unlike that of past periods—depends upon revolutions in our understanding of structural relationships in the nervous system. We believe that a substantial strengthening of this discipline in the Department of Anatomy would be a great encouragement toward further development of neurobiology elsewhere in the University. We think that, although leadership may be invested in a particular department, other units should share to the extent that their specialties and appointment opportunities permit. The plan

should be broad enough to encompass biopsychology as well as the elements lying within the Divisional boundary proper.

Evolutionary Biology. The group of functional morphologists in the Department of Anatomy plays a major role in graduate training, both in the Department and through the Committee on Evolutionary Biology. This area is one of The University of Chicago's great strengths, and appointments in other areas should take advantage of that fact. The size of the departmental representation in this area, however, is adequate, and we would not recommend expanding it. Graduate training in the discipline seems sound and vigorous, though we note that the Committee design does not guarantee, as it well might, that doctoral students will develop adequate knowledge of modern evolutionary theory and population biology.

IV. Recommendations

Given the Department of Anatomy's history, its current problems, and its opportunities, the Committee carefully considered three possible options for the future: first, retention of the status quo; second, reassignment of the Department; third, continuation of the basic structure with new leadership. For reasons given above, we rejected the second alternative. Choosing between the first and third was more difficult. In the end, although we found no compelling reasons having to do with the performance of the present chairman for rejecting the *status quo*, we were impressed by the following facts:

1. Through retirement and resignation alone, it will be possible to add five new appointments to the Department in the next year. An unparalleled opportunity therefore exists to make a dramatic forward step.

2. The crystallization of new organizations in other basic medical science departments offers new scope for interrelating departmental activities.

3. New areas, rather than the ones so successfully developed in the Department over the past decade, require strengthening in the immediate future.

We think that the circumstances favor moving in a new direction. An extremely attractive opportunity exists that may or may not recur soon for attracting a major appointment from the outside, and giving the new appointee the lead in overseeing a new phase in the Department's de-

velopment. We think that an overly detailed sketch of the candidate's interests in advance of a search would be a mistake—certainly for this Committee, and perhaps even for the University. We do think it important that the new person be able to play a leading role in developments between departments, as well as within the Department of Anatomy. Given the generally understood intention to increase strength in neurobiology, it would seem to us logical to think of neuroanatomy as one field that might meet both requirements.

In conclusion, we emphasize that the tensions now present in the Department of Anatomy are not entirely unhealthy. To the extent that they represent personality conflicts and misunderstandings they are unfortunate; to the extent that they represent failures of communication they can and should be corrected. But to a considerable degree we came to regard them as the vigorous, sometimes sharp by-products of well-meaning and serious concerns about the Department's future and its mission.

The present situation represents a real opportunity. The Chairman has built well, and the De-

partment has emerged with unusual strengths in some areas. Yet largely for historical reasons it now needs to alter somewhat the direction of its development. The Division will soon have a new Dean, and has new departmental organization in two other basic science areas. These circumstances dictate a close look at the pattern of activities within the Division, and suggest a more coordinated kind of academic planning that takes account of clustering of strengths across departmental lines. The Chicago environment is basically encouraging to that kind of building, and we have tried to suggest ways in which we think that development of the Department of Anatomy can play a critical role in it.

W. Maxwell Cowan, Washington University (St. Louis)

Don W. Fawcett, Harvard Medical School

Paul Gross, University of Rochester

Donald Kennedy (Chairman), Stanford University

Walle J. Nauta, Massachusetts Institute of Technology

David B. Wake, University of California, Berkeley

REPORT OF THE STUDENT OMBUDSMAN FOR THE WINTER QUARTER, 1975

During Winter Quarter, 1975, I investigated over 80 complaints and referred about the same number of complainants to other areas where they could be helped. Of the 80 complaints I investigated, about 70 were solved to the student's satisfaction. The number of complaints this quarter is an increase over prior years and reflects an increasing awareness, I hope, of the existence and utility of the Ombudsman's Office.

The general purpose of the Ombudsman's Office is to investigate specific complaints without superseding the University's regular remedial processes. Often this amounts specifically to re-

ducing friction between parts of the University and the student with the general effect of improving the quality of life in the University community. I have been successful at solving many student problems, but I can solve only those which are brought to my attention.

The problems brought to my active attention fall into three principal categories. First are the problems which the student could have possibly brought directly to an instructor or administrator to have solved. In these cases, if I judged that the problem could be difficult or that the student had already been troubled enough, I intervened. The