

ADDRESS TO FACULTY OF SCIENCE

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It is with considerable hesitation that I attempt a "state of the union" message. The end of the year is a good time to try to think about the past and the future of the Faculty and the University. There are a number of things that I want to say, some of them very much on the minds of all of you.

I would like to recall the meeting of September 24, 1965. It might be worthwhile to have a look at the agenda that was developed in the minutes of that meeting, see how many of them have been achieved, and determine the targets that we should aim for over the next two years.

First, research. The university has a strong tradition in all research disciplines that were already in existence, and to many, and in particular, physics, chemistry, and other co-operative groups for funds. We now have five research programs in each department, and a total of more than \$100,000 in grants from N.R.C. and other bodies. The Department of Biology have, for the first time, the credit of having a co-operative project with all the Universities of Ontario and other institutions in the Province in the Research Station at Black Sturgeon Falls.

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Second, but not less important, teaching. An attempt would be made to initiate honors work in all existing departments. Honors programs are now well established in most departments in the Faculty of Science.

Third, graduate work. It was proposed that the Masters program should be initiated after the honors program had been initiated. There are now Master's students in most departments. BY JOHN HART

Fourth, Computer Science. The creation of Computer Science faculty members and equipment was most used as a study development. We have an Honors program in Computer Science and a computer that is being used inter alia by the Faculty of Science. APRIL 11, 1968

The faculty, administration, students, and the university have worked together very hard to achieve this almost impossible development. It is, I think, safe to say that the benefit of the long-range planning that they have achieved is apparent for a long time to come. The University, I think, appreciates the situation and is anxious to help the Faculty and will continue to give it the support and encouragement it deserves.

This time I hope for a continuation of the efforts and a personal statement by me will perhaps be necessary to help the situation. After all, it seems that a good speech is a similar situation was made.

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It is with considerable trepidation that I attempt a "state of the union" message. The end of the year is a good time as any to think about the past and the future of the Faculty and the University. There are a number of things that I want to say, some of them very much on the minds of all of us.

I would like to recall the faculty meeting of September 24, 1965. It might be worthwhile to have a look at the goals that were defined in the minutes of that meeting; see how many of them have been achieved, and define realistic targets that we should aim for over the next two years.

First, research. The aim was, that we should develop the small research programs that were already in existence; add to them, and, in particular, approach N.R.C. and other co-operative groups for funds. We now have lively research programs in every department, and for two years in succession have received more than \$100,000. in grants from N.R.C. and other bodies. The Department of Biology have, or are just on the point of having a co-operative project with all the Universities of Ontario and other institutions in the Province in the Research Station at Black Sturgeon Falls.

Second, but not less important, teaching. An attempt would be made to initiate honors work in all existing departments. Honors programs are now well established in most departments in the Faculty of Science.

Third, graduate work. It was proposed that the Masters program should begin shortly after the Honors program had been initiated. There are now Masters students in most departments, and Ph.D. students are also working in the laboratories of the Faculty.

Fourth, Computer Science. The addition of Computer Science faculty members and equipment was mentioned as a likely development. We have an Honors program in Computer Science and a computer that is being used inter alia by the Faculty of Science for teaching and research.

The faculty, demonstrators, instructors, technicians and the administration have pulled together magnificently to achieve this almost incredible development (without, incidentally, the benefit of the long-range planning teams that other new universities appointed long before they even opened their doors). The University, I trust, appreciates the strength and expertise of this Faculty and will continue to give it the support and encouragement it deserves.

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The time is ripe for a re-assessment of our goals and a personal statement by me, to perhaps be regarded as semi-official, might be useful. After all, it is two and a half years since a similar statement was made.

Teaching. A Dean has to balance research versus teaching. He has to do

it in various ways--by individuals, by departments, or even by Faculties; and it is a lucky Dean indeed who is able to get somebody who is a first-class teacher, enjoys teaching 600 first-year students, organises the teaching laboratories, undertakes wonderful new research and at the same time, manages to serve on fifteen different committees. In practice, therefore, what a Dean looks for is a balance between various individuals; and during the appointing procedure he examines with some care the relationship between the present state of the Department and the applicant's published works, his teaching performance. I try to assess where particular strengths are needed. It is not always easy; sometimes we over-estimate and sometimes we under-estimate. The advice of the Chairmen and other faculty members is a help to the Dean in making this assessment, particularly when there is doubt as to whether a man is suitable for elementary teaching.

The A.U.C.C., I might interject, has made a number of statements about university teaching that are equivalent to being in favour of academic motherhood. One statement, in particular, which we often hear bandied about is that the top people (without defining who these top people are) should be teaching first-year courses. This I find naive in the extreme. First year courses are important: we all realise that. But, on the other hand, an expert in a discipline teaching a first year course may turn out to be disastrous: he simply may not have the flair or the vocabulary to inspire his students. My views about the teaching of these important year one courses are simple. Instructors who undertake them try, if it is at all possible, to get to the level of the students, hold their attention and keep them busy with relevant work: some instructors, as they themselves are aware, lack knowledge of rudimentary instructional techniques and we might be able to supply them with some expert guidance during the early part of each academic year.

The Dean has the problem of deciding how many instructors should be allocated to a Department, how many people he should ask the President for. We have to examine the criterion to be used for assessing the size of a departmental staff: I have made one point repeatedly, which is that the number of instructors in a Faculty does not depend merely upon the number of students. The number of instructors depends upon the number of courses being offered, and upon the amount of work other than direct classroom instruction that a faculty member is undertaking. This means that any formula used internally or externally must be non-linear and must be heavily weighted in favour of the small Department, the small Faculty and the small University. Formula financing on a linear basis is irrational.

The Committee on University Affairs, through its Chairman has made some most extraordinary statements. One of them proposes a model for a university of the size of Lakehead which is clearly, to the dimmest intellect, unworkable. The figures on which the proposal is based, however one tries to rationalise them, are absurd; the administration, and in particular, the President, are losing no opportunity to point out the absurdity of these figures. At the last meeting of the Council of Deans of Arts and Science of the Universities of Ontario, I think the new universities, for the first time, made their colleagues in the older institutions understand something of their problems.

Part of my responsibility is to keep the demands of individual departments down to a reasonable size that I can justify to the President and the Senate. I have to ask that the number of options be kept down: I include, not only the number of options within a department, but duplication between departments and between Faculties. Whatever formula we use, we cannot afford to permit two instructors to duplicate classes that are relatively small, i.e. to classes with enrolments well below the maximum (perhaps the optimum would be a better word). We must remember, also, however regretfully, that large first-year courses make money. The money makers are English 1a6, Psychology 1a6 and so on; which probably contribute very heavily to our grant on a formula basis, but the warning has to be made that neither within this Faculty or across the University as a whole should formulae in any way be used to determine what resources a department needs.

We need the number of instructors necessary to teach the undergraduate lecture and laboratory courses that have been approved over the past three years. We have the approval of Senate to proceed to the Masters program. I would remind you that these Masters programs would be heavy on faculty and that the Faculty stated clearly that it is my job to make representation to the President or to the Senate, or to whatever body is to decide on the distribution of funds, to ensure that these programs come to full fruition. A Ph.D. program, which I envisage, is not heavy on staff (this may surprise the uninitiated), and once we have a good Masters program going, the staffing of the Ph.D. program will not be a serious problem.

I should mention that one proposal made by the Committee on University Affairs was that we concentrate on inter-disciplinary subjects at the undergraduate level. For example, there would be no Physics, Chemistry, but Chemical Physics, no Physics, no Biology, but Biophysics. In practice, however, a small university, especially a new small university, must recognise the professional divisions that exist in the scientific world. These divisions are perpetuated in professional associations--the Association of Physicists, the Chemical Institute of Canada, the Institute of Electrical Engineers and so on. We would, indeed, be foolish to attempt to start graduating students with no clearly recognised status in their discipline. I am not suggesting that inter-disciplinary subjects are to be frowned on, and like most of you I believe that the major advances lie in the interdisciplinary fields, but to suggest that we specialize in joint fields because we do not have an adequate faculty to offer each one individually is absurd.

Research. In research, we expect to develop interdisciplinary problems, with strictly limited objectives. The pulp and paper project and the Biological Field Station have involved and will continue to involve a lot of people and a lot of hard work as well. I would like to say a few words about the changing status of research in this faculty. Research needs continuous encouragement of all kinds including a little bit of needling and strong material support. It is always easier not to do research than to do it: it is the job of each one of us to provide this material encouragement and support. The professional status of this Faculty outside the university, as you well know, rests on your individual satisfying relationships with scientists in Canada and

outside Canada. These satisfying relationships develop only if reputation in a particular field is established. This is true of a department, of a faculty or of a university as a whole. In certain limited fields, I have no doubt whatever that the staff of this university, not only is capable of international status but will achieve international status and will achieve it quite soon. In every other university (with perhaps one or two small exceptions) research is a normal function, reflected in conversation, correspondence and publication. Teaching is not to be under-estimated: it is an equal function with the research, perhaps a little more or a little less important in various universities, but always in a Faculty of Science a normal function is research, discussed on an informal basis at least as often as teaching is.

To cover undergraduate teaching effectively, we must have instructors with wide interests. Not only do we have to have the teachers and the research workers, but within fields, we have to have people interested in the different specialities within each department so that we can truly say that our students are turned out with a good undergraduate education. But, paradoxically, the best results in research often come when specialists work closely together in one field. The only cure is size--a small faculty will be below critical mass for both teaching and research.

Administration. In the administration there are clear weaknesses and to combat these, I would like to reiterate that we have two channels for communication. For day-to-day administration, the channel is from the instructor to the Chairman, the Dean and the President. I would like to emphasize that, attractive as such a course might appear to be at the time, a short-circuit in this system weakens it in the long run, and I would ask you to avoid a step in it only in emergencies. The second channel is the one that we are using right now--for academic matters the channel is from the instructor through the Faculty to a Senate Committee or the Senate. We have to develop this channel in the next year or two, starting with formal recognition of Faculties by the Senate: at the moment there is no such recognition. The Senate will consider new courses in a Faculty despite the fact that these courses have not been discussed in the Faculty itself; and I made the point, and I will continue to make it, that the opinions of all faculty members are valuable: often a man will spot something that has been missed by the people preparing the courses. You saw two good examples of that to-day. So I look for some more formal statements as to the function of the Faculty. I have obtained from another university the constitution of a Faculty of Science which we might have time to consider next year, subsequently presenting our own constitution to the Senate for ratification.

One ward on the key to academic administration is registration, and we know that next year the registration will be far more efficiently organised than it was this year. The Calendar will be available, the regulations will be relatively well known and furthermore, the students will be aware that they have certain responsibilities. I have taken the liberty of asking Dr. Talbot and Professor Green to act as Deputy Deans at registration, and directly the new calendar comes out they will sit down and learn it from cover to cover. Their signatures on the forms will be approval of a student in a course. The only students that come to me will be the extremely difficult cases that they feel they would rather not rule on.

I would like to make a plea at this time for restraint in the proliferation of our regulations: they should be kept simple. It is easy to pass a motion requiring a student to meet yet another criterion: it is quite another matter to ensure that he meets it. We have a Faculty of Science Committee which is examining some of the regulations, and I hope that committee will always keep in mind the necessity for cutting out, rather than instituting new regulations.

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Speaking more generally now, this faculty is under considerable pressure. We talk here about events that are taken as normal in other universities, as though they were quite extraordinary and abnormal. In well-established universities, it is well recognised that there are imbalances in budgets and course loads, and horror of horrors, there are even imbalances in salaries: these facts of life, regarded as perfectly normal at the larger more established institutions. I cannot pass this opportunity without mentioning the documents presented by the senior members of the Faculty of Arts. A number of statistics are mentioned in those documents. Some of them are correct and some of them are wrong; but that is not the point: the point is that no author of this document has, to my knowledge, conducted a serious study to discover whether, in fact, there is any true disparity. I hesitate to use the trite phrase, "lies, damn lies and statistics" but the function of the University is not demonstrated by figures on a piece of paper. For example, what is the weight of a published text book? An inspired student? A perfect lecture? A model examination? What, for that matter is the weight of a laboratory course: is it the nominal one-third that we allow in the Calendar or should it have full weight as a lecture course? What is the relationship of the problem marking assistants, essay markers, laboratory markers, laboratory instructors and television assistance, what is their relationship to the faculty employed? What is the function of a Dean or Chairman? The housekeeping chores alone in a science department; the ordering, the keeping of inventory, the chasing down of recalcitrant members who phone orders in without covering them with a purchase request, all these things take a phenomenal amount of time on the part of the Departmental Chairman; and these functions do not exist to the same extent in other Faculties.

One statement that I see in the brief of these senior members of the Faculty of Arts with which we can live is that the Faculty of Science should not increase its ratio of the total budget which it received. This statement I agree with and I would certainly be prepared to act upon it, though it may cause us all some hardship. In this connection, the Senate is examining the necessity for a Budget Committee. I have just one observation about the Senate Committees, and that is that we should be careful of inbreeding. In other words we should be careful that we have members on our most influential committees who have not spent an inordinately large proportion of their time in one university.

We have to show our colleagues in the other Faculties and Schools three things. One is that research is essential to scientists. The second thing is that we need continual financial support from the University. I do not mean from other Faculties, and I eschew the use of a formula internally. It is a great pity that

the Department of University Affairs, despite an explicit warning that the formula should not be used for that purpose, is using it, at least implicitly, on an internal basis. The third thing, is that we need recognition that a full course load for a scientist is at the very most two courses plus one full laboratory session, and we have to discuss and discover what a full laboratory session is.

What developments do I see? So far as individual faculty members are concerned, I see a change in the explicit statements to be made about tenure and promotion procedures. Whatever these procedures may be (and this is a matter for the Faculty Association and the Administration) I mention only the academic requirements that I foresee. First, a recognition of research to be assessed on a basis not dissimilar to that used by N.R.C. Committees. Second, but not less, recognition of outstanding teaching. By outstanding, I want you to understand exactly what I mean: I do not mean an attendance at class, a bare minimum of problems marked and handed back, presence in the office at specified times: that I do not regard as outstanding teaching. Outstanding teaching is very much more than that. It is a concern for the student, it is an ability to be recognised as a fine teacher by one's colleagues inside and outside this university; and it is the ability (and I would not attempt to define this ability) above all to communicate enthusiasm for a subject to a student. The third requirement that we look for is administration as a proper function. In other words, if someone is working on committees and really working on them, then obviously this is a factor that must be taken seriously into account. On the other hand, if a person is a "joiner", and contributes very little, then clearly this is not a criterion that can be used by the Chairman of a Department or a Dean in making the recommendations. These are personal statements from me and no doubt there will be reactions to them which I look for and welcome.

Our business at hand is then as follows:-

We have to develop our good research projects. In passing, I would like to ask you to consider whether in fact the facilities for research are not much better than some of you are prepared to admit. The climate for research is not just provided by the physical plant that is available: it is provided by the encouragement that senior members of the faculty give to the junior members of the faculty in conducting their research projects, and it is important that this climate should be fostered by the senior members of the departments. Second, we must continue to improve the existing undergraduate programs: immediately an instructor thinks that a course is perfect, that is the time for him to stop lecturing.

More specifically, we hope to develop the Geology and Computer Science programs. We have to develop and have assessed Masters programs and we must institute Ph.D. programs possibly on a co-operative basis.

I have attempted to make projections for the number of faculty members

that we shall need over the next few years. These are what I would consider to be the minimum number with whom we can run the existing programs. The number of students in the faculty being forecast to double by 1970 it turns out that the total number of faculty rise by about 37%. The faculty will rise for 1968 - 43; 1969 - 53; 1970 - 59. This is the minimum with which we can operate the present and planned programs. (The number of students will rise from 220 this year to 440 by 1970.) Whether we can achieve even these figures under formula financing remains to be seen.

In closing I would just like to make one further remark. It is not trite to say that we are fighting for the University. We are a university, we have a charter, we are required or charged with offering all degrees. We need to turn our attention outward. The President is our official representative so far as our external administrative problems are concerned and I want not just to re-assure you but to reinforce very strongly the impression that he is doing his damndest outside the University. In so far as he represents us administratively, it is our job to represent him academically at our academic and professional meetings, and especially in the learned journals.

BY JOHN HART

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