

## EDUCATION FOR SURVEYORS

A Discussion of the Paper Presented by Prof. S. H. DeJong at the Can. Inst. of Surveying, Jan. 1958

As Professor DeJong felt his audience was in agreement with him regarding the need for education of surveyors at the professional level, he went on to discuss some of the problems and possible solutions involving university education for surveyors.

We must keep in mind University courses have changed and are changing away from technical training in the past to a broadly scientific mathematical and cultural base in the present, which, if survey courses are established, will be their basic nature. Increased enrollment in the future will require expansion of the universities' facilities. They will graduate increasing numbers of young people as the future members of the professions. To maintain a balanced society all professions must be represented. Surveying as a profession must be upheld by educating surveyors who will take their place in the practice of the profession and direct its affairs for the enhancement of the profession's value to society.

Professional education has three aspects. First is the cultural phase which can only be acquired or "caught" by associating with men of culture and broad interests in the liberal arts. This is best achieved at University level. Secondly, there is the broad mathematical and scientific base mostly acquired in the first two years. Thirdly, in the last two years there is the emphasis on application of mathematics and science in the students chosen field. Here is where specialized surveying subjects should come in, some of which would be new subjects not now taught, and some substituted for certain applied and pure science subjects of civil engineering.

Prof. DeJong went on to discuss civil engineering old and new. The older civil engineering courses were heavy with survey subjects. Growth and development of the sciences have meant branching out into other fields of engineering. Structural theory and complexity of design have reduced the time and context of surveying courses needed for adequate training of today's professional surveyor.

There are three ways by which a Canadian University could establish a degree course to meet the needs of the surveying profession.

1. By options in the present civil engineering course leading to the degree of Bachelor of Applied Science in Civil Engineering as already adopted by the University of Toronto.
2. By setting up a course in surveying on the same broad scientific and cultural base as in engineering leading to a degree of Bachelor of Applied Science in Surveying.
3. Setting up a separate curriculum from Applied Science for professional surveying needs, leading to the degree of Bachelor of Science, as in Ohio State University.

Each way has advantages and disadvantages. The first way, through options presents least difficulties but is a palliative and not a cure. It may not lead to a satisfactory course.

The second method has the problem of high administrative costs. If set up it should be adequate regardless of changes and pressures in the strictly civil engineering courses.

The third way can be achieved, but would need to meet approval of boards of examiners of the land surveying professions. The graduate would not be qualified to practice engineering. It is common experience that students in the arts and science faculties would be at a disadvantage in taking many of the applied science survey-courses in the engineering faculty.

Prof. DeJong leans toward the second alternative which would produce graduates with basic education for any branch of surveying and also for private practice in surveying where he is often associated with engineering. For the higher branches of surveying, post-graduate work would be required, as in the case of most other professions.

After a discussion of curricula, Prof. DeJong spoke of the problems which would be involved if a course was established in one university only for the education of Canadian Surveyors, as suggested by Dr. Howlett at a previous C. I. S. meeting. The problem is, would the particular university accept credits of other universities, as students from across the country would unlikely be able to take all their work at that university, preferring to take the first 2 or 3 years of work at their home university.

The problem of the sources of students would be one which would require assistance and support of the surveying profession in order to bring students from across Canada to study at a single institution. He suggests a number of ways in which this could be accomplished.

Space does not permit of detailed discussion of Prof. DeJong's outline of the problems of costs and institutional staffing. He closed his talk on the aspects of the acceptance and recognition of university standards if a course was instituted. Such standards should be accepted for the D. L. S., D. T. S. and other land survey commissions. Prof. DeJong says "The principle of examination must be retained and standards must be upheld but this can be done by examining men for their professional competence after they have established their academic status and engaged in suitable practice for a given period of time" (underlining by the editor). If university standards were not acceptable to the associations, universities would be reluctant to go ahead with surveying courses. One effect would be to lessen the work of the Association's examining boards.

In conclusion Prof. DeJong says "An attempt has been made in this paper to indicate the present trends in university professional education, to show how surveying education may be fitted into the pattern, to indicate costs to all concerned; to point out the responsibilities various parties may have to assume; to show how adjustments in procedure and flexibility in thinking may make solutions possible and to raise the hope that if we put a united effort into this project we shall achieve our aims".

This synopsis cannot do justice to Prof. DeJong's ideas. The interested reader is referred to the April, 1958 issue of "The Canadian Surveyor" which published his paper in full.

C. E. Stauffer

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PROSPECT POINT, for many years a brink-side vantage point, immediately north of the American Falls, became only a name in history when, on July 28, 1954, the 185,000 tons of rock which had comprised the Point split away and crashed to the base of the cliff, reshaping the north extremity of the Falls. On December 4 of the same year, 15,000 tons of rock fell from the middle of the cataract, altering that portion of its crestline.

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Except in the mildest of winters, ice from the upper river and the Great Lakes collects in the basin below both Falls, forming an ICE BRIDGE sometimes as much as 100 feet thick. Trees, shrubs and lamp posts in the vicinity of the cataracts assume grotesque shapes as they become heavily coated with frozen spray. Under the glittering sun or the fairyland colours of the lights, Niagara Falls in winter is an impressive sight.