ON A ONCE DEEP THEOREM CONJECTURED BY SYLVESTER

and

THE KIND OF THINGS I LEARNED AND LIKED

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Rapporteur: Crystin Emmett

DISCUSSION

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Lecture One

Professor Knuth asked about the extension of Professor Dijkstra's solution to three dimensions. Professor Dijkstra confirmed that it could be done, depending on one's definitions of distinctness in a plane.

Professor Tedd summarised Professor Dijkstra's talk as demonstrating that a theorem which had taken many years to solve could be expressed as a simple-looking computer program. He asked if he should infer that programming was really difficult, in a mathematical sense, to a mathematician. Professor Dijkstra, after commenting that untrained mathematicians did indeed find programming very difficult, replied that his program was short and that the correctness proof was simple. In general a program was a very compact form of displaying the results of one's intellectual labours.

Professor Rabin commented that the proof was almost forced upon one, to which Professor Dijkstra agreed, and proposed another theorem for consideration. In this, the points in a plane are arbitrarily coloured either red or blue and the theorem states that there exists a unicoloured line passing through at least two points. Professor Dijkstra said that he would consider this problem, and he thanked Professor Rabin for bringing it to his attention.

In answer to a question from Professor Bron, Professor Dijkstra stated that his solution would be even easier if A had been heuristically chosen to be the middle point of those under consideration. He added that the influence of education was very noticeable in people's understanding of the implications of monotonicity.

Lecture Two

Professor Randell, referring to the title of Professor Dijkstra's talk, asked if he had given thought to interrupts, semaphores, multiprogramming or levels of abstraction when planning his talk. Professor Dijkstra said that he had considered those topics but had decided not to talk about them. However, he might have said that semaphores were introduced because he wanted to move the showing of the correctness of operating systems from analog to discrete reasoning. During the first few years of teaching about semaphores he had found it very difficult to convince his audiences that co-operation between processes, without considering their speed ratios, was worth talking about. He had said that knowledge of relative speeds led to unnecessarily complicated arguments, whereas his listeners felt that he was disregarding valuable knowledge. Now the concept of communicating and co-operating processes with roughly undefined speed ratios was a familiar abstraction. Alternatively, audiences were more aware that abstraction was necessary. He hoped that the latter, more encouraging, possibility was the case.

Professor Best referred to the last, short remark in Professor Dijkstra's talk and commented that, if one wanted to prove the axiom of assignment using relational semantics, a long and complicated proof was necessary. He began to ask if Professor Dijkstra's explanation would help here. Professor Dijkstra spoke enthusiastically of considering relational calculus as a special form of predicate calculus, where one considers predicates as characteristic functions of subsets and introduces relational calculus by giving the underlying space a Cartesian structure.