predict while walking to school that he was going to be given the test on Friday. So the test must take place between Monday and Thursday. But the same argument works for Thursday. That is, on Thursday morning, any student could deduce from the facts that there can be no surprise test on Friday, and that there will be a test, and as it is Thursday the correct prediction is that the test will be given that day. Clearly the argument can be extended to show that the test cannot be given on Wednesday, Tuesday or Monday. The conclusion is that the test cannot be given at all.

The teacher heard this objection out, and then gave the test on the following Tuesday, surprising, in the required sense, everyone.

The puzzle here is to see what has gone wrong with the argument. Clearly the teacher can give the surprise test. How is it the case, then, that an apparently impeccable argument can produce the conclusion that no surprise test is possible?

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It is odd to confront a piece of reasoning that is valid only on some particular Thursday evening or Friday morning, but this very oddity suggests a key to the puzzle: time. The bright student in the story says, "If Thursday went by, and still no test, it couldn't be a surprise on Friday, so we can scratch Friday." --Sorry, but Friday has this about it, that you can't scratch it for real until Thursday. That is, you can't scratch it for real by imagining that Thursday's class has ended and thus ruling Friday out. The reasoning in the puzzle derives its appearance of force from our forgetting that, for us humans, the whole time between the start of Monday's class and the end of Thursday's has to be lived through before a student is in a position to downgrade the teacher's logic. It is within that sequence of days that the teacher can bring off her surprise test.

The time-range in which she can spring the test extends from the start of Monday's class to near the end of Thursday's. As Thursday's class passes its halfway mark, the student does not know if she will give the test in the minutes remaining. Suppose she does; then the student will have no grievance, for the teacher came through with the test at a time he could not predict for certain on his way to school. But what can the student say if she doesn't give the test on Thursday? "You let too much time go by-- now the element of surprise is gone." This is hardly a logical lapse on the teacher's part, though it may show a bit of absent-mindedness. The main point, however, is that her student is not in a position to make even that guarded judgment until the sands of Thursday's class run out.

With these considerations in mind, I wonder if what we have here could be called an existential paradox, in as much as the puzzle can take hold of the student only if he forgets a certain temporal feature of his human existence, namely that he cannot reason himself forward to the end of the week, and then work backwards through time, but has to exist through the intervening days one by one and wait to see what each day brings.

conference reports

A PANEL ON INFORMAL LOGIC

This Report was submitted by Professor Samuel Fohr of the University of Pittsburgh at Bradford.

A Panel on Informal Logic was presented at the Behrend Campus of Penn State University in Erie, Pa. at the Spring meeting of the Tri-State Philosophical Association on April 21, 1979. The Panel was organized and chaired by William Rapaport of the State University of New York, College of Fredonia. The other participants were Samuel Fohr of the University of Pittsburgh at Bradford, James Liotta of Lake Erie College, and Nelson Pole of Cleveland State University.

Samuel Fohr pointed out that informal logic courses could help people to arrive at more true beliefs and fewer false beliefs. But the value of such courses could be seriously diminished by how they were taught and the books which were used. Philosophers have not been as rigorous in their treatment of non-symbolic logic as they have been in their treatment of symbolic logic. Many writers of logic books have been either sloppy or incorrect in their definitions of basic terms such as "valid," "sound," "deductive argument," and "inductive argument." Any way of distinguishing between deductive and inductive arguments which is not based on the intentions of the person putting forward the argument is faulty. The word "fallacy" is used very loosely by many philosophers. Strictly speaking, a fallacy is an error in inference or in drawing a conclusion from some premises. Yet philosophers have tended to identify assertions they take to be false as fallacies. One refers to the fallacy of equating determinism with fatalism, another to the fallacy of taking the rightness or wrongness of actions to be related to the motives for which they are done. Writers of logic books have gone far beyond this in identifying things as fallacies. Among other things the following have been identified in logic books as fallacies: questionable claim (practically every claim is), emotionally charged language, suppressed evidence, dog-

matism, and appeal to force or threatening someone. One should at least divide the traditional group of fallacies into two groups--fallacies and tricks.

Informal fallacies have been presented in a haphazard manner. When an author tries to sort them out, he may do so incorrectly. One author listed begging the question under the heading "Fallacions Because Invalid." One useful way to categorize the fallacies is by listing them all under three headings: irrelevance, hasty conclusion and circular reasoning. This can help a person see what is problematic about almost any fallacy. The teaching of the fallacies of composition and division as fallacies of ambiguity is an example of the confusion found in the presentation of informal fallacies. For at least three sets of fallacies are covered under the heading "composition-division" only one of which involves using words in two different senses.

Informal logic courses can be useful if only in getting students to first, differentiate between passages which offer no argument and passages which do, and second, identify the premises and conclusions of an argument. But we would hope that informal logic courses would do more. If they are to do so teachers and book writers are going to have to get their house in order.

Nelson Pole noted that he had at one time taught a section on informal fallacies in his deductive logic course. He gave it up for two reasons. First, it seemed to most impress students who wished to go into advertising. They appreciated aid in developing their bag of tricks. Second, the material seemed remedial. People should know it before coming to college. Two developments led to a change of mind on teaching such material. First, he became aware that in many programs for bright students informal logic and its applications to real life arguments (as opposed to text book cases) were considered appropriate and challenging. Second, he became aware that a non-remedial informal logic course was possible. He has designed a new course in applied logic. The goal is to enable students to be able to critically evaluate real life arguments as they are presented naturally and to be able to dissect a set of premises and construct from them a defensible conclusion. Little stress is put on the names of various fallacies and on identifying fallacies from a long list of names. The skills of the course include the following: how to find out what you believe (for most people aren't clear about what they actually believe), how to identify and distinguish premises and conclusions, how to evaluate another person's argument, how to construct an argument, how to overcome blind spots in your thinking, how to detect consistent and inconsistent statements, and how to pass the logic portions of the Graduate Record Exam, the Law School Admission Test, and the Medical School Admission Test. The course stresses not only negative matters like finding fallacies, but also positive ones like constructing good arguments. Such a course, when properly promoted, should attract a large number of students both from those who are having practical problems in reasoning as well as from those who desire to do well on pre-professional aptitude tests.

James Liotta pointed up the fact that the decision to have either formal or informal logic taught is not pedagogical. One isn't easier to teach than the other, or better than the other, or more valuable for students. It would be best if students were exposed to an in-depth study of both. But schools are likely to require or recommend only one course, and a short one at that. The decision as to which to offer then becomes "political."

Certain problems come up over and over again in teaching logic. One is getting students to identify the premises and conclusions of arguments. Students seem to have trouble doing this even when analyzing the simplest of arguments. Another problem is getting the students accustomed to doing formal logic. Syllogistic reasoning, which is often taught in non-symbolic logic courses can form a bridge between informal and formal logic. What is necessary is to teach syllogistic reasoning in such a way that the class terms are seen as symbols rather than words with a particular meaning. The use of bracketing and awkward constructions can help students in this regard. The result of this is that they will more easily see the invalidity of arguments which "sound right" and more easily accept as valid arguments which are counter intuitive. Getting them used to manipulating symbols in this way will help give them confidence for working problems in symbolic logic and mathematics. For those who have a mental block against mathematics or anything that resembles it (and many students do have such a block) these techniques can be a great help.

Teaching Logic, whether formal or informal, will not cause students to be more rational. But it can be of help to those who are already rational.

William Rapaport discussed the fact that there were at least three broad categories of informal logic courses (all of them quite distinguishable from mathematical logic courses) corresponding to three sorts of texts. First there is informal logic as a bag of tricks: how to win arguments, influence people and defend yourself. This sort of course will include some informal logic, some non-symbolic formal logic and some symbolic logic. A text which corresponds to this approach is Copi's Introduction to Logic. Second there is informal logic as a list of fallacies: how not to argue. Kahane's Logic and Contemporary Rhetoric suggests itself here. Third, informal logic as a semi-formal way to read and think critically. This is the approach of Scriven in his book Reasoning.

As to the value of a course in informal logic, it should be pointed out that doing mathematical logic (e.g., learning a natural

deduction system) isn't directly useful in the everyday life of students. The crucial problems in applying a natural deduction system to a real-world argument are the translation steps (in both directions). This sort of problem is better addressed by a type-three course. Further, mathematical logic, given enough practice and success, can give the student a useful methodology, but one course isn't sufficient to do this. What is needed, then, is something more practical, something that will arm the students with a method they can use to construct or evaluate arguments (or any prose). The Scriven-type course offers that, but needs to be supplemented by Copi-type material. The Kahane-type is good as a source of examples of what not to do, but this should come out of a Scriven-Copi type of course as well.

Rapaport went on to describe a special two-semester inter-disciplinary informal logic course taught with members of the English Department. It was called "Effective Thinking and Communicating." [A report on this course has been published in the Informal Logic Newsletter, Vol. I, No. 3, pp. 6-7.]

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CONFERENCE REPORT -- "LOGIC AND LIBERAL LEARNING"

On June 11-13, 1979 the editors were guests at the Conference on Logic and Liberal Learning held at Carnegie-Mellon University in Pittsburgh and organized by Professor Preston Covey of C-MU's philosophy department. The purpose of the conference was to investigate, in a critical way, the role that the learning of logic does and ought to play in an undergraduate liberal arts education, and we were there to see to what extent informal logic was considered in this review. This report of the conference will reflect our angle of interest.

For a great many of these who read papers, of the panelists and of the 200-odd philosophers who attended, the term "logic" in the conference title meant "formal deductive logic". This conveyed the impression that not only informal logic, but also inductive logic, have second-class citizenship. On the first afternoon of the conference, Professor Merilee Salmon (Arizona at Tucson) was moved, at least in defense of inductive logic, to label as deductive chauvinists those who implied that "logic" = "deductive logic". (The issue was joined over the question of how arguments expressed in natural language and ordinary discourse are most correctly and profitably to be reconstructed. Prof. Salmon used her epithet to characterize those who claimed that all such arguments are to be reconstructed as valid deductive arguments.) A fair amount of time was subsequently spent by people denying that their position was in fact that of deductive chauvinism. During this controversy, it occurred to us later, there was no pause to consider other possibilities--for instance, whether there might be arguments in ordinary discourse that fit neither the deductive nor the inductive mold, or whether the move to reconstitute all arguments so as to make them amenable to formal analysis does violence to some of them.

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Monday morning, opening session.

Conference Chairman Preston Covey set the stage by using the medieval distinction between logica utens (logic as a useful art; logic applied) and logica docens (logic as a speculative science; logical theory), to ask the questions: (1) What logical artifice is necessary for liberal education? and (2) What logical theory is required for the logical artifice that is necessary?

In the morning's first paper, Nuel Belnap (Pittsburgh) argued that the main value of logic (read: formal logic) for freshmen is that it conveys the ideal of rigour. He was followed by Gerald Massey (Pittsburgh) who sketched the kind of formal logic course he would recommend. His thesis was that the development of natural deduction systems and truth tables has driven the axiomatic method from the field, and that what is wanted is a simple system to teach axiomatic logic--transformation rules, the notions of proof, theorem, completeness, consistency and independence. He emphasized that the axiomatic method cannot be understood unless one understands the formal axiomatic method. Natural deduction systems should be retained to motivate, for instance, the application of logic to common language and to motivate understanding the horseshoe in terms of the deducibility-in-the-system of the consequent from the antecedent and focus on the idea of good inference rather than on intuitive English interpretations of "if..., then...". Moreover, these systems can be used to teach deductive strategies. Massey said that techniques introduced in the last 20 years now make accessible to introductory students branches of logic that were once inaccessible. However, he warned emphatically, logic should not be touted as a way of sorting out good arguments from bad ones, since logic cannot show that an argument is invalid. (Massey argued that there is no non-relative, absolute, system independent concept of validity, so whether an argument form is good or bad--i.e., valid or invalid--is also system-relative.)

* * *

Monday afternoon, second session.

Thomas Schwartz (Dept. of Government, Texas) opened the afternoon session with the provocative charge that the standard teaching of formal logic (formal theory, mechanical symbolic logic) is irrelevant to the objective of teaching a person to be able to reason well, while standard informal logic courses sacrifice rigour for applicability. Schwartz proposed that we begin with a clear, well-specified educational objective (including a target skill) such that its attainment is intrinsically worthwhile, and he suggested this objective should be the ability to pick apart, criticize and reconstruct arguments in the way that philosophers typically do. He outlined a step-by-step procedure for realizing this objective. First, reconstruct the argument under examination so that it is (a) deductively valid, (b) fully explicit, and (c) devoid of extraneous material. (In doing so, use as criteria for tacit premises: fidelity to the author's intentions, generosity in rendering the argument plausible, and the maximum generality possible consistent with the other requirements.) Second, search out any ambiguity in the argument (expressions with ambiguous meanings, premises used in ambiguous ways, terms within premises used in ambiguous ways). Third, evaluate the argument by looking for premises that are false or not sufficiently plausible, checking for self-defeating or question-begging premises, counter-exampling general premises, and testing the arguer's assumptions by seeing if any premises could reasonably be made more general. Schwartz argued that while his approach required no symbolic apparatus, it was rigorous because, employing deductive validity as the central principle of organization and interpretation, it constitutes a procedure that is rigorous. He argued, further, that by turning inductive arguments into deductive ones by adding the requisite tacit premise required, the underlying inductive principles assumed in such arguments could be made explicit. These can then be checked by looking for alternative explanatory hypotheses that are more plausible or more economical (i.e., have as much or more explanatory power with less complexity).

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Monday afternoon, panel discussion.

Following Schwartz's paper three panelists, Robert Fogelin (Yale), Merilee Salmon (Arizona) and Douglas Stalker (Illinois, Chicago Circle) issued some reactions and interjected some new thoughts.

Fogelin focussed on the importance of teaching students how to understand daily arguments, the usefulness of the theory of speech acts a la Grice and Austin for doing this, and the importance (he called this the main task) of making people explicitly aware of the moves actually taking place and what words are being used to do. Fogelin entered a demurral about the value of testing for deductive validity and stressed that typically the situation is forensic, with considerations weighing on either side, as well as often strongly analogical. (Fogelin claimed there is a great need for the study of analogical reasoning.)

Merilee Salmon took dead aim, in her comments, on the question of whether arguments are best understood as exclusively deductive, and came out four-square against the position that they are. It was here that she introduced the phrase "deductive chauvinism". She pointed out that her students, mostly in the business program, don't encounter arguments that can be construed as deductive in any helpful way. She urged starting with natural arguments and looking first at the structure of inductive analogical arguments. Her experience, she reported, was that after two-thirds of the term was spent on inductive arguments and informal analysis of arguments, students are then ready for symbols, and are able to pick up such techniques as truth tables and Venn diagrams in a few days.

Stalker raised the new question: What, if anything, is known about the effectiveness of our logic courses? Do they really teach the students anything--anything that remains with them? He insisted that there is a need for hard empirical data here, and, moreover, that at present none exists. We ought to be trying to get answers to such questions as: What are the intuitive judgements college students need to test? What are the typical kinds of arguments they encounter? (We need a frequency count here.) Which textbooks work better than others? Many of the questions being speculated about at the conference about the value of what we are doing in teaching logic in various ways depend for their answers on what the facts are. But no one seems to be generating these facts.

* * *

Tuesday morning, third session.

Preston Covey (Carnegie-Mellon) opened the second day with a description of a humanities course he teaches to freshman arts, social science and business students, that has the interesting feature of using some symbolic logic as a heuristic constraint to focus attention on the assumptions underlying issues in disputes about values and social policy, and the further interesting feature of using the computer to teach that symbolic logic. Covey uses the computer to teach ordinary sentential quantification logic in one month (instead of the usual entire semester). He then has his students reconstruct current arguments about social values in valid deductive form, with the goals of (1) making presumed logical connections as explicit and precise as possible, (2) making underlying principles as explicit and precise as possible, and (3) mapping argumentative strategies by being explicit about what is necessary or sufficient in the way of needed assumptions. Covey's experience with this approach to teaching a philosophy course about social values is that it brings out the real problems,

the conflicts of principles, and forces students to get more serious about how hard it is to come to grips with important issues.

The second speaker in the morning session was Joan Straumanis (Denison), who explained two programs in Computer Assisted Instruction (Cal) which she has used in her teaching. She became interested in CAI to save time and grief, and to avoid the tedious business of checking proofs. A major problem in teaching symbolic logic is providing early feedback to students learning to do proofs. Ordinarily the teacher first sees samples of such proofs only after notational and procedural errors are already ingrained and must then be unlearned. And some students have so much difficulty in getting started that they cannot produce completed proofs at all, and have nothing to submit. In large classes, the instructor cannot offer the kind of concentrated and individualized help that may be needed. This makes CAI worth serious consideration.

The program developed by Straumanis is called DEMON, a line-by-line proof checker for propositional logic. The program does the following. (1) It evaluates each symbolic statement supplied by the student to see whether or not it is well formed. (2) It checks each line of the student's proof to determine whether it is a legitimate inference from the premises and earlier lines of the proof. (3) It provides error diagnosis and hints for correct rule interpretation. DEMON also is programmed to give positive feedback when the student gets the proof. Example responses: "Ingenious!" "Super!" and "Stop trying to fool me!" DEMON can be combined with FRAME (a program developed by Professor Morton L. Schagrin) which offers drill and feedback on translating English into and from logical symbols.

Straumanis noted that the class average is up, and average students seem most pleased about the process. (Bright students are irritated: they don't want to take time with the computer) She suggested that from the point of view of theory the computer dramatizes the fact that a proof is deductive, brings up for class discussion the role of ingenuity in logic, and dramatizes the point that proofs can be generalized. Pedagogically, it provides immediate and positive feedback, has patience, speaks with the instructor's voice, provides privacy, distinguishes feedback from evaluation, allows for flexible scheduling, is self-paced, teaches computer literacy and overcomes the fear of computer hardware, and it is an explicit transition from English grammar to non-numerical symbols, which helps the students who have anxieties about math. Straumanis stressed that (a) you can't make the case that logic teaches people to think, since people do not think this way: deduction doesn't model thought; and (b) the evidence just doesn't support the claim that there is transferability of rigour and problem-solving skills to other domains. She believed that what may transfer are: translation skills and attention to the rules of English grammar, ability to spot ambiguity, the idea of proof, the method of math and maybe science, possibly skills useful in legal reasoning. But the main payoff of CAI is that it relieves the teacher from the non-teachable elements of the course, and frees her time for other things.

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Tuesday afternoon, fourth session.

In the first afternoon session, Peter Facione (then, Director, Division of General Studies, Bowling Green; now, Dean of Human Development & Community Service, California State University at Fullerton) began by urging that course content should be based on course goals, and more specifically that the desired student outcomes, specifically conceived, should be the rationale for the instructor's focus and approach. He proposed that a logic course should be conceived as producing critical thinking skills, which need to be precisely and operationally specified. He offered the following seven skills as doing this job: (1) gathering information; (2) identifying issues; (3) selecting arguments; (4) determining hypotheses; (5) evaluating positions; (6) formulating positions; (7) expressing alternatives. What is also needed is a decision procedure (or something like it) to help the student put into practice each of these skills-and to do so in an integrated way. Facione's suggested procedure for the skill of evaluating positions is outlined here:

Step 1: Identify the parts of the argument.

Step 2: Rewrite the argument.

Step 3: Ask these four questions:

(1) Are the premises of the reconstructed argument true?

(2) Do the argument's premises, taken together, demonstrate that the conclusion must be true or is very probably true?

(3) Do the argument's premises avoid deriving their support from the argument's conclusion?

(4) Does the argument's stated conclusion amount logically to the conclusion the author intended to demonstrate?

In the afternoon's second session Alex Michalos (Guelph) approached the role of formal logic in a liberal education by first developing a picture of a liberal education. This he sees as an education which aims at increasing the chances for development of the individual and the community--a free person in a free society. It should teach (1) character and moral virtue, which will promote social development, (2) the knowledge needed to im-

prove the world, and (3) the techniques needed to change the world. The question of whether there is a role for formal logic in liberal education thus becomes the question whether formal logic contributes to these aims. Michalos sees formal logic as essentially teaching the skill in drawing valid inferences and avoiding contradictions. Clearly these are intrinsically valuable skills, but are they more valuable than other things that might be taught in their stead? He claimed that much of what is taught in formal logic courses is busy-work, of little value in teaching the contradiction-avoiding skill, and not clearly better than alternatives. He proposed that since an argument can go wrong in three ways--be invalid, have false premises, and be methodologically defective--a course that includes all three would be more widely relevant, and this would be a mixture of formal and informal logic.

Robert Baum (Rensselaer Polytechnic Institute), in the third afternoon session, urged a revision of our conceptualization of the inductive-deductive distinction. The standard way of characterizing deductive arguments as those in which the arguer intends the premises to necessitate the conclusion is not useful in dealing with real arguments in everyday contexts where it is usually impossible to determine the arguer's intentions. Moreover, this psychological criterion does not apply at all in formal logic, where form alone is of interest, and it prevents allowing for invalid deductive arguments. Baum proposed taking arguments as a generic category indicating a relationship among sets of statements which could then subdivide into three categories: (1) valid deductive arguments, (2) inductive arguments of various degrees of strength from weak to strong, and (3) non-arguments. With these distinctions students can approach arguments with an open mind and run a test to determine how to classify them. Baum went on to argue that the distinction of inductive arguments into those which are inductive generalizations (with a universal proposition as a conclusion) and those which are inductions by analogy (with a particular proposition as a conclusion), is not a useful distinction. It is possible that all inductive arguments employ analogies. And it is more important to recognize the multiplicity of possible kinds of inductive argument. In general, Baum said, we should discourage having too many categories and distinctions; moreover, we should not lump inductive logic with informal logic, since formal analyses of inductive arguments are possible.

In the fourth and final session Tuesday afternoon Wesley Salmon (Arizona at Tucson) spoke in praise of relevance on behalf of inductive logic, in two senses. He argued, first, that we should try to make logic relevant to important topics of the day that students are or should be interested in (e.g., the DC-10 crash at Chicago; the use of radioactive isotopes (tritium) in making illuminated signs). These, and many others--perhaps the most important examples--involve causal considerations in an absolutely significant fashion. So it should be an essential part of an introductory logic course to take up causal arguments, and Salmon expressed amazement that causal arguments had not yet been discussed during the conference. He averred that what treatment there is of causal arguments in introductory texts is often a slanted and misleading discussion of Mill's methods. Salmon's defense of relevance in the second sense emerged from his discussion of Mill's method of agreement and method of difference. He argued that we need to pay more attention to the concept of the relevance of causal conditions. This is a gap in the treatment of inductive logic; a crucial logical concept is that of statistical relevance --the relationship between two probability values. He suggested that this can be examined using formal methods (cf. Carnap, Logical Foundations of Probability, Ch. 8). Salmon then proceeded to demonstrate some problems for the logic of confirmation, which involves a relevance relation. In sum, elementary logic should be relevant by enabling students to evaluate causal and statistical arguments used in current public issues, and theorists should devote attention to the relevance relation in causal arguments.

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Wednesday morning, fifth session.

This session was given to the question of how logical competence is to be evaluated. Robert Ennis and Thomas Tomko (Illinois, Urbana-Champaign) of the Illinois Rational Thinking Project gave papers. Ennis discussed his five-dimensional conception of logical competence, consisting of (1) interpreting the argument, (2) handling varieties of content, (3) judging in accord with logical principles, (4) handling complexities, and (5) applying the skills in various contexts. In interpreting, the problem of translation is key, and this involves a sense for the functions of various terms, for ambiguity, and in effect of rules for language use. One is moving from natural language to some standard form, and there are empirical questions about what works best here that have not been answered. There seems to be a close connection between reading skills and interpretation skills. (This is being studied at the IRTP now.) Ennis noted that in handling content it has been found that one's belief in the premises or conclusion seems to affect one's ability to see the argument's validity. Also, arguments with arbitrary symbols, unfamiliar content and abstract content are harder to reason with than their opposites. The complexity of the argument also seems to make reasoning more difficult, though it is hard to isolate this from the other components of rational thinking. Ennis discussed the applications of rational thinking skills in finding assumptions to construct the best line of reasoning, in

making deductions to the best explanation, and in working with direct proofs and clarifying complex relationships. He recounted an experience of serving on a jury, when it seemed his logical skills were useful in interpreting the instructions to the jury for fellow jurors. His judgement is that there is a role for deductive competence in good thinking, and that good thinking is important for a liberally educated person.

Your reporters had to leave the conference after Ennis's talk. We can report this outline of Tomko's paper on the evaluation of formal logic competence. He spoke to the importance of clarifying what is to be evaluated and for what purpose it is being evaluated, distinguishing between evaluating courses and students, and between evaluating to decide whether a course or program is worthwhile as a whole and to decide how it might be improved. He discussed the gathering of evidence; the construction of tests, the use of tests, other approaches to gathering evidence such as observation, surveys and questionnaires, small group discussions and interviews, and long-term follow-up. He concluded with the suggestions that more than one method be used for gathering evidence, that tests and alternative methods of assessment for measuring logical competence need to be developed, and that additional psychological research on logical competence is desirable.

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Concluding remarks.

As readers can gather, this conference was packed to the seams with ideas, differing perspectives and novel suggestions. We congratulate Preston Covey for the enormous and valuable job of putting the conference together and running it with enviable smoothness. It was a useful hothouse experience for us.

We came away with the impression that for a great many people logic still equals formal deductive logic, with inductive logic a distance second. Informal logic is still regarded by many as the study of fallacies and nothing more. It remains our belief that such a perception of informal logic stems from ignorance of its recent development and of the exciting possibilities these portend. We expect that as the word gets out this perception will slowly, if grudgingly, change.

conference notices

A symposium on "Theory of Knowledge and Science Policy" is being held December 13-16, 1979 at the University of Ghent, Belgium. It is an interdisciplinary symposium on the relevance of new developments in the analysis of knowledge for both critical and constructive approaches to science policy. The organizing committee is chaired by Prof. Leo Apostel (Ghent).

The symposium proposes to confront developments in contemporary Theory of Knowledge (science of science, epistemology, etc.) with those in contemporary Science Policy and Criticisms, in order to determine possible mutual interdependencies as well as eventual exclusiveness of alternatives in either domain. Researchers from both branches and scholars who focus on the interrelationships proper will present their views. A renovating presentation of scholarly work is expected through participation of researchers on a worldwide scale.

Invited speakers include: Leo Apostel (Ghent, Belgium), Donald T. Campbell (Northwestern U., Chicago, U.S.A.), Gerard de Zeeuw (Amsterdam, Netherlands), Nelson Goodman (Harvard, U.S.A.), Yves de Hemptinne (Unesco, Paris), George Hines (Nat. Univ., New Zealand), Jaakko Hintikka (Helsinki, Finland; Florida, U.S.A.), Karlin Knorr (Vienna, Austria), Larry Laudan (Pittsburgh, U.S.A.), Jürgen Mittelstrass (Warsaw, Poland), Leszek Nowak (Poznan, Poland), Jean Piaget (Geneve, Switzerland), Ilya Prignogine (Brussels, Belgium; Austin, U.S.A.), Hilary Rose (Bradford, UK). Steven Rose (The Open University, UK), Richard Whitley (Manchester, UK), John Ziman (Bristol, UK).

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For people who could not have attended anyway, it is almost as important to know about conferences held in the recent past as about those in the future. Such information helps one keep track of interests and developments in the field. Here, then, is the list of topics at the Australian logic Teachers'