

B. K. de Garis tells a story of gentlemanly nineteenth century intrigue in which the Colonial Office sought by devious means to bring about "improvements" in the draft Commonwealth Constitution but failed to gain its objectives. Its failure seems clearly due to the oversecretive methods adopted to obtain those objectives. The delegates from this brash new country of the Empire were very likely to be touchy about criticism of their Draft Constitution of 1897. But should it not have been seen from the beginning that substantial amendment after many more months of discussion and after two referenda had been held would be practically out of the question? Dr de Garis reports that the leader of Her Majesty's Opposition in the House of Commons certainly thought so. The essay provides a revealing insight into the machinations of nineteenth century Imperial diplomacy.

Janet Pettman's survey of the activity or inactivity of the Australian Natives Association in South Australia during the federation campaign will, no doubt, prove useful to those assembling the jigsaw of federation history. It is, however, a rather dull story. The activity of the A.N.A. in South Australia after 1891 we are told was negligible even though all the right people belonged. Rather than the A.N.A. strengthening the federal movement in that state the federal movement strengthened the A.N.A.

One cannot expect a collection of essays by different authors to read like a unified work produced by a single author but these essays have so little connection apart from their concern with aspects of federation that the whole volume appears rather disjointed. It is suggested that Australian Federation is really too broad a heading under which to group a handful of essays which cannot hope to cover more than a fraction of the total field. Accordingly it might be better to base the future volumes of essays which A. W. Martin hopes to see on somewhat narrower themes, thus giving each of them a unity.

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Outlines of Modern Legal Logic, ILMAR TAMMELO, MAG. IUR. (Tartu), DR. IUR. (Marburg), M.A. (Melb.), LL.M. (Syd.), Reader in International Law and Jurisprudence, University of Sydney. (Franz Steiner Verlag, 1969), pp. i-xv, 1-167.

Although courses in logic are becoming increasingly common in American law schools, they are quite rare in Australia. The Law School of Sydney has offered a course in logic since 1960 and this book ranges over the scope of that course. The book is a revised

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version of the author's *The Lawyer's Logic, a Compendium of Logic in the Service of Law* issued in stencilled form by the Australian Society of Legal Philosophy during 1966—indeed throughout its text the book is referred to as a “compendium”.

Dr Tammelo is exclusively concerned here with the treatment of formal logic. He does not however pretend to present a thesis that legal reasoning is essentially formal, and stresses the great importance for law of informal arguments, some of which surprisingly appear in Chapter III. The inclusion of the description “legal logic” in the title is clearly intended to indicate no more and no less than that examples taken from *law* are used for illustrating principles of logic that are applicable generally irrespective of subject-matter. There is no attempt, in other words, to suggest that “legal logic”, “geological logic”, “medical logic”, “architectural logic” *etc.* each have unique formal structures. Students in each of these areas, if they study logic at all, study the *same* principles, just as they would study the same principles in mathematics courses which favoured examples flavoured to suit the special content of each course.

Except for booklets by Layman E. Allen this is the only logic text known to the reviewer written in English by a law teacher. Like Allen's booklets, this uses the Polish notation which is unusual in English texts. Although that notation is very tidy for handling propositional logic, it appears to have pedagogical disadvantages elsewhere compared with other available notations. The two main beginners' texts in English which do use Polish notation, and which cover material analogous to that in this text, are omitted from the author's bibliography, namely J. M. Bochenski, *A Precise of Mathematical Logic* (1959) and J. Lukasiewicz, *Elements of Mathematical Logic* (1963)—both translations from original Polish editions.

The bibliography is quite detailed and includes not only works suitable for further reference but also texts well outside the scope of a student completing the elementary course contained in this book. It includes major works of historic interest by Boole, Peano, Frege and Russell, several works having a legal orientation but available only in foreign languages (most of these are too poor to qualify as academic texts) and also some works not concerned at all with formal logic. Since the bibliography lists only one work published after 1966 it is assumed that the book was completed in that year. This no doubt explains why no reference is made in the text to currently popular semantic tableaux techniques which appear to be replacing deduction in introductory logic books.

The principal objection likely to be taken by a logician is that whereas the book is styled a work in *Modern* logic, it throughout adopts (indeed champions) presuppositions of traditional logic which were taken for granted until the closing part of the 19th Century but which

are now generally rejected by logicians. In particular, a disproportionate part of the book is concerned with the Aristotelean syllogism purposely restricted in its application to cases where existential import can be given to universal propositions. To this extent Dr Tammelo's logic is not really a "general" subject-predicate logic, as its application is limited to those statements whose contents have previously been analysed to ensure that they are amenable to the processes of Aristotelean logic. Because of this many might wish to conclude that if the book is "modern" it is so only in the sense that it uses contemporary symbolism to restate a very old logic: the book gives us ancient logic in modern dress.

What I find particularly disappointing in the treatment of the syllogism (setting aside the severe restriction just mentioned) is that Dr Tammelo presents at least eight methods for testing validity whereas in a book for beginners one would have expected the author to select the one method considered neatest by him. The principal syllogistic methods examined are called "traditional logic" (page 17 ff), "predicational logic" (page 64 ff), "extensional logic" (page 76 ff) and "sign constellation" logic (Appendix A). In Appendix D there are two further methods for handling syllogisms; and the section called "traditional logic" contains three distinct methods.

Dr Tammelo divides his treatment of propositional logic into two successive stages, the first of which he calls "protological" calculus. This is an unusual method of introducing propositional logic, and appears to carry with it unnecessary duplication. Given only very minor verbal changes the "protological" calculus is a replica of "propositional" logic, from the existence of which it gives every appearance of having been constructed *post facto*. As it is presented in this book, students appear to be required to learn two languages merely so that they might forget the first after the second has been learnt. There is no evidence that the second depends in any way upon the first nor that it is not easier to learn than the first. The learning of these languages is complicated even for those already familiar with logic because the author regularly invents neologisms instead of adopting words from standard logic books. I personally found the neologisms irritating and am not convinced that any of them is more desirable than the established terms used by logicians.

In this review I limit myself largely to examining Dr Tammelo's treatment of the deductive system given for propositional logic. The system does not differ from those found in most introductory logic texts published during the 1950's and suffers from the same defects—it is archaic and inelegant. It is however a complete system in that it can be used by those with sufficient patience and ingenuity to provide proofs for any valid propositional argument. Detracting from the presentation are the two illustrative proofs given at pages 60 and 63 which are both clumsily constructed.

An interesting feature is that the operators J, O, I and D introduced as parts of the "protological" calculus are now discarded from the system, though inconsistently some rules for their manipulation are retained. These operators merely complicate any system of logic, and their appearance in a textbook cannot be justified.

The selection by Dr Tammelo of his deduction rules is not satisfactorily explained. We were told (page 57) that the selection would be made from the large number given at pages 53-54. But we find new rules added—and sometimes it is difficult to see why some rules have been discarded. What justification is there for discarding the absorption and importation rules? Indeed the importation rule *is used* as Step 13 in the proof given at page 63, though it is there wrongly labelled as an application of the exportation rule.

The new rules added concern transformations where the list at page 53 is far from complete. Rules added are the first De Morgan rule and the conjunctive equivalent for Epq . Why a disjunctive equivalent for Epq is not given is not explained. If the reason is that it can be derived from other rules, so also can the conjunctive equivalent. Indeed a defect of the rules selected is that there are already too many of them. As a point of interest it should perhaps be noted that a third version of De Morgan's Law is included in the list of transformations at page 53. Most teachers of logic generalise this law rather than restrict it formally to the two rules at page 58. This saves the tedious use of $D.N.$ in proofs and reductions, for example, Step 6 at page 146.

An oddity is the retention of two "autology" rules which cannot play any independent role in deductions—rules are already available to justify a move such as Step 14 on page 63; and the disjunctive addition rule covers the other "autology" rule. It is technically faulty to retain any "autology" rule since this tends to suggest that the *content* of any particular statement is relevant to its formal manipulation, which it is not.

The section introduces us (page 55) to both substitution and replacement rules, but it makes use only of the latter. In a system with so many rules, it is a pity that room was not found for a most powerful additional rule enabling a tautology to be introduced as any line in any proof. This rule would help considerably to take the boredom out of proof construction.

As alternatives to deduction the author explains the use of normal forms (Appendix C). In this treatment $EEpqAKpqKNpNq$ is wrongly given (page 144) as a useful rule for CNF . Since CNF aims to derive a conjunction of disjunctions, the appropriate useful equivalence is rather $EEpqKANpqANqp$. The discussion of when a disjunction (alternation)

is tautologous (page 145) suggests that (a) and (b) describe different circumstances. In the context of CNF, (a) and (b) are identical and will always have the appearance of (a).

A further decision procedure for propositional logic is given in Appendix B—short cut method. Since this is a decision procedure, the statement (page 138) that the method “is not applicable in every case” is wrong. Although it is stated that reasons will be given to show why it is not always applicable, these are not given. Instead we are told (page 142) that it can be used in every case, though sometimes not as rapidly as in others. It is also not correct to say that value exhaustion is a matter of trial and error (page 142). The steps are always finite and determinate.

In his discussion of propositional logic (and in other sections) the author confuses three types of symbols kept separate by logicians. If “*p*” is given as a propositional *variable* in the formation rules of the system (page 49) then it should retain that function throughout. Instead it is sometimes used as a variable, at other times as a *constant* when it assumes the status of given sentences. Finally the author also generalises it (page 145) for substitution purposes so that it is treated as a “complex proposition”. To prevent this confusion capital letters could have been used for constants and Greek letters for generalisation purposes.

The first two sections of Chapter III are original contributions by the author and stand out as the best pages of the book. Other parts of this chapter are out of place in a book avowedly devoted to formal logic, and the discussion of “gaps” in the law (page 106) can be understood only in relation to the legal systems of those countries whose codes claim to be exhaustive. Perhaps the 5th and 6th sections of this chapter are the least tidy in the book. Here formal and informal arguments are juxtaposed almost indiscriminately, and confusion is added by using different names in the two sections for the same form of argument. What is generally known as “denial of the antecedent” is called the “fallacy of unwarranted denial” in Section 5, but *argumentum a contrario* in Section 6. Even in the same section an argument by analogy is called *argumentum a fortiori* at page 127 and *argumentum a simile* at page 129.

Errors noted in a portion of the book not here reviewed: quantifiers in line 23, page 67 should be interchanged; the variable attached to predicates in lines 15 and 16 of page 68 should be omitted.

The production of any book which would make logic more acceptable to law students must be commended. It would be inappropriate to criticise this book because the course contained in it might not be a course favoured by the reviewer. I have accordingly restricted myself to indicating that the book is not as tidy or rigorous as one should

expect from a textbook of logic. I understand that the author has other logic books in course of publication, and that deficiencies of this first book will be remedied as those books appear.

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