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Logical Constants as Punctuation Marks

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Abstract This paper presents a proof-theoretical approach to the question "What is a logical constant?" This approach starts with the assumption that logic is the science of formal deductions, and that basic formal deductions are structural deductions, i.e. deductions independent of any constant of the language to which the premises and conclusions belong. Logical constants, on which the remaining formal deductions are dependent, may be said to serve as "punctuation marks" for some structural features of deductions; this punctuation function, exhibited in equivalences which amount to analyses of logical constants, is taken as a criterion for being a logical constant. The paper presents an account of philosophical analysis which covers the proposed analyses of logical constants. Some related assumptions concerning logic are also considered. In particular, since a logical system is completely determined by its structural deductions, alternative logical systems arise by changing structural deductions while having constants with the same punctuation function. Some other approaches to the question "What is a logical constant?", grammatical, model-theoretical, and proof-theoretical, are briefly considered.

1 Introduction It is clear that an answer to the question "What is a logical constant?" would provide us with the means to answer the question "Where are the limits of logic?" Since the latter question is obviously very close to the ques-

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