SEMANTICAL ARCHAEOLOGY: A PARABLE

ABSTRACT. A somewhat fictionalized account of several interpretations of implication is presented together with comparisons between classical, modal, tense, and intuitionistic logics.

Toward the middle of the last century on an obscure, uninhabited island in the eastern Mediterranean, a considerable number of clay fragments were unearthed covered with mysterious symbols. After years of careful cleaning and sorting they were finally rather surprisingly arranged to form several long panels. Even the missing parts were reconstructed by intricate measurements and clever comparisons. Nevertheless, no amount of study yielded their proper decipherment.

Late one evening a young scholar sat alone in his room pouring over the photographs and drawings of the panels, pondering the question of their meaning. He had fixed on his wall several examples of the more outstanding recurrent sequences to be found in the inscriptions; in particular these:

(1) \( ax\beta xCC \),
(2) \( ax\gamma xCC \beta xC \),
(3) \( ax\gamma C CC \beta xC \).

We need not retell here the exciting story, which figured so heavily in all the news reports, of how he came first to reverse the order of the symbols, then to make the very ingenious substitution of \( \Rightarrow \) for \( C \) and \( p, q, r \) for \( x, \beta, \gamma \), and finally to discover the necessary, though far from obvious, change of word order which produced:

(1') \( [[[p \Rightarrow q] \Rightarrow p] \Rightarrow p] \),
(2') \( [[[r \Rightarrow p] \Rightarrow q] \Rightarrow [r \Rightarrow p]] \Rightarrow [r \Rightarrow p] \),
(3') \( [[p \Rightarrow q] \Rightarrow [[q \Rightarrow r] \Rightarrow [p \Rightarrow r]] \).

Rather, we shall be more interested in this paper in the less dramatic problem of interpretation.

It goes without saying that the first idea occurring to everyone (after

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the most difficult part of the task had already been done) was that these curious sequences of symbols represented logical truths. This was an especially appealing hypothesis in view of the well-known traits of a related and still existing people on a nearby island. They had preserved over the centuries a rudimentary logic and had indeed asserted the general correctness of principles similar to (1)–(3). This fact was noted for the first time by an anthropological field worker, who lived for some years among the tribe, a war-like and unpleasant group. One day he had occasion to enquire of his informant just what he meant by implication. The man at once became astonishingly angry and started to jump around excitedly, shouting: “What do you mean, what do I mean? Implication is implication! Have you no concept of the true and the false?” Somehow it was clear that the anthropologist had stumbled upon a highly touchy point of tribal religion, but the heated retort did serve to communicate some clue to the unhappy investigator. As he was later able to show in his thesis, this hard-headed philosophy of the tribe which demanded that every statement must either be true or false leads directly to a logic that can be interpreted by truth tables – or at least he showed that the interpretation agreed most favorably with the available data. Furthermore, he thought he was even able to identify occurrences of truth tables in some of the more elaborate punched-card work of the tribe, but unfortunately the manuals describing this handicraft were never shown to outsiders.

It is such a pity that the young man who originally deciphered the panels died so early (from lack of central heating some say) before he had a chance to complete his labors. We are, however, able to follow his reasoning about the proper interpretation of the inscriptions quite well from the note books he left. It seems that the island people (already extinct in classical times) were well-known from legends to be sweet, reasonable, tolerant, and highly theoretical – the apparent causes of their downfall. Before the disastrous wars, they had travelled widely and collected vast quantities of information. The site where the panels were found was apparently (and this was reasonably confirmed by later digs) the university library. The panels themselves were decorative in nature and obviously commemorated their outstanding achievements in pure logic. What our young scholar noted at once was that examples of both valid and invalid principles were given. Thus (2’) and (3’) occurred on the positive side, while (1’) was on the negative side. This discovery, of course, ruled