Kinoshita, Shin'ichi &
Terasaka, Hidetaka
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On Unions of Knots

By Shin'ichi KINOSHITA and Hidetaka TERASAKA

Introduction

If two knots κ and κ' with a common arc α, of which κ lies inside a cube Q and κ' outside of it, α lying naturally on the boundary of Q, are joined together along α, that is, if α is deleted to obtain a single knot out of κ and κ', then we have by definition the product of κ and κ'. If a knot κ cannot be the product of any two non trivial knots, then κ is said to be prime. It is H. Schubert [9] who showed that the genus of the product of two knots is equal to the sum of their genera and that every non trivial knot is decomposable in a unique way into prime knots.

Now a close inspection through the table of knots by Alexander and Briggs [1] as reproduced in the book of Reidemeister [8], where only prime knots are given, or rather a simple experiment by a thread, will show that there are a number of knots composed of prime knots in a more complicated way. Thus 8_5, 8_{10}, 8_{15}, $8_{19(n)}$, $8_{20(n)}$, $8_{21(n)}$, 9_{16}, 9_{24} and 9_{28} of the Alexander Briggs table are all composed of two trefoil knots 3_1 in the following way (Fig. 1 indicates the composition of 8_{19} out of two 3_1): First join the trefoil knots κ and κ' together along their arcs $\widehat{AB}$

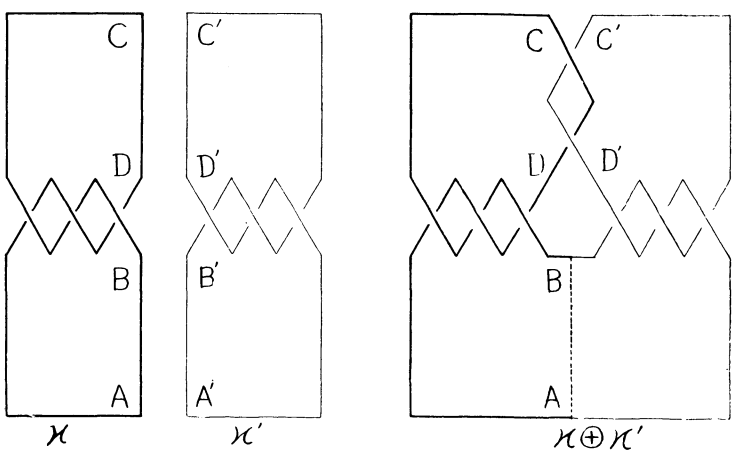

Fig. 1.