

PhD Seminars 2004/2005: Prof. R. Brown Semester 1

Gareth Evans

November 24, 2004

Contents

1 Seminar 1: 23rd November 2004

2

1 Seminar 1: 23rd November 2004

In this seminar, Ronnie talked through his 1980 paper “On the Second Relative Homotopy Group of an Adjunction Space: An Exposition of a Theorem of J.H.C. Whitehead” which appeared in J. London Math. Soc. (2), 22 (1980), 146–152. Here is the first paragraph of the introduction:

Let $X = X_0 \cup \{e_\lambda^2\}_{\lambda \in \Lambda}$ be a space obtained by attaching 2-cells to X_0 , and let $x_0 \in X_0$. In his 1941 paper [reference], J.H.C. Whitehead attempted an algebraic description of the second homotopy group $\pi_2(X, x_0)$. In his 1946 paper [reference] his results were reformulated (with some corrections of definitions) in terms of a precise algebraic description of the second relative homotopy groupoid

$$A = \pi_2(X, X_0, x_0).$$

In his 1949 paper [reference], a different exposition of part of the proof was given, and also the result was codified finally in saying that *the group A is the free crossed $\pi_1(X_0, x_0)$ -module on the 2-cells.*

As part of the seminar, guidance was given on some of the notation in the paper, the many steps of the proof were described, and diagrams were handed out illustrating several aspects of the proof.