is of course the multiplication in A_1). By the proof of Theorem 2, in order to show the equivalence of A and A_1 it is sufficient to show that $[w, w]=\gamma f$ and $[w, z]=[zU, w]$ for every z of R. But $[w, w]=w(f^{-1}w)=(fg)(f^{-1}fg)=fg^2=\gamma f$, and $[w, z]=w(f^{-1}z)=(fg)(f^{-1}fx)=(fg)x=g(x\cdot fS)=(f\cdot xS)g=(f\cdot xS)(f^{-1}fg)=zU(f^{-1}w)=[zU, w]$. This proves the theorem.

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ON FIBRE SPACES. I

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In subsequent papers I propose to investigate various properties of fibre spaces.[1] The object of the fundamental Hurewicz-Steenrod definition[1] is to state a minimum[2] set of readily verifiable conditions under which the covering homotopy theorem[1] holds. An apparent defect of their definition is that it is not topologically invariant. In fact, for topological space X and metrizable non-compact space B the property "X is a fibre space over B" depends on the metric of B. The object of this note is to give a topologically invariant definition of fibre space and to show that (when B is metrizable) X is a fibre space over B in this sense if and only if B has a metric in which X is a fibre space over B in the sense of Hurewicz-Steenrod. Since the definition of fibre space is controlled by the covering homotopy theorem, an essential part of my program is to give a topologically invariant definition of uniform homotopy.

Let π be a continuous mapping of a topological space X into another topological space B. Let $\Delta=\Delta(B)$ denote the diagonal set $\sum_{b\in B}(b, b)$ of the product space $B\times B$ and let $\bar{\pi}$ denote the mapping of $X\times B$ into $B\times B$ which is induced by the mapping π according to the rule $\bar{\pi}(x, b)=(\pi(x), b)$. Thus the graph G of π is the set $\bar{\pi}^{-1}(\Delta)$, and $\bar{\pi}^{-1}(U)$ is a neighborhood of G whenever U is a neighborhood of Δ.

Any neighborhood U of Δ determines uniquely a covering of B by neighborhoods $N_U(b)$ according to the rule $b'\in N_U(b)$ when $(b, b')\in U$.

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[1] W. Hurewicz and N. E. Steenrod, Proc. Nat. Acad. Sci. U.S.A. vol. 27 (1941) p. 61.

[2] How well they succeeded in this will be indicated in my next communication.