condition $2k \equiv 0 \pmod{q-1}$ implies that $2^{2k}-2 \equiv -1 \pmod{q}$.) Thus we have proved:

LEMMA 2. *The number* $2(2k-1)!\, s_k$, *when expressed as a fraction in lowest terms, has denominator* $b_k k_1$.

PROOF OF THEOREM 2. If $r=4k$ is a multiple of $2(q-1)q^i$, it follows that q is of rank k. Hence q divides b_k and q^i divides k_1; so that q^{i+1} divides the denominator of $b_k k_1$. Together with Theorem 1, Corollary 2 this completes the proof.

THE CARTESIAN PRODUCT OF A CERTAIN NONMANIFOLD AND A LINE IS E^4

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An upper semicontinuous decomposition G of E^3 into points and tame arcs is defined in [1] such that the decomposition space B is topologically different from E^3. Interesting properties of this space have also been given by Fort [**4**], Curtis [**2**; **3**], and Wilder [**3**]. We show that the cartesian product of the space B and a line E^1 is topologically E^4. Perhaps the argument used is related to that employed by Arnold Shapiro to show that the cartesian product of a manifold described by Whitehead in [**5**] and a line is topologically E^4.

The arcs of the decomposition G are intersections of double tori as shown in the figure. The solid double torus contains four double tori T_1, T_2, T_3, T_4 as shown; each T_i in turn contains four double tori T_{i1}, T_{i2}, T_{i3}, T_{i4} (not shown) imbedded in T_i as T_1, T_2, T_3, T_4 were imbedded in T; more double tori are imbedded in the T_{ij}'s; etc. The tame arcs of the decomposition G are the components of

$$T \cdot \Sigma T_i \cdot \Sigma T_{ij} \cdot \Sigma T_{ijk} \cdot \cdots .$$

Although these tame arcs are mutually exclusive, it is not possible to get a 2-sphere in E^3 that misses their sum and separates two of them. No topological cube in T contains $T_1+T_2+T_3+T_4$.

When the cartesian product is taken, the extra dimension enables one to unravel certain linking handles in the sense that if $[a, b]$ is

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