objection to the assumption that preferences are *convex,* i.e. that for $q^4 > q^8$, and for $0 < A < 1$, $Att'l + (l—A)(7^8 > q^8$. This translates immediately into quasi-concavity of the utility function $v(q)$, i.e. for q^4, 47^8, $0 < A < 1$,

$$v(q^A) \; L \; v(e) \text{ implies } u(Aq^A + (1— \})de) \; v(q^8). \qquad (1)$$

Henceforth, I shall assume that the consumer acts so as to maximise the monotone, continuous and quasi-concave utility function $v(q)$.

It is common, in preparation for empirical work, to assume, in addition to the above properties, that the utility function is *strictly* quasi-concave (so that for

< A <1 the second inequality in (1) is strict), *differentiable,* and that all goods are *essential,* i.e_ that in all circumstances all goods are bought. All these assumptions are convenient in particular situations. But they are all restrictive and all rule out phenomena that are likely to be important in some empirical situations. Figure 1 illustrates in two dimensions. All of the illustrated indifference curves are associated with quasi-concave utility functions, but only *A* is either differentiable or strictly quasi-concave. The flat segments on ***B*** and *C* would be ruled out by strict quasi-concavity; hence, strictness ensures single-val-

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Figure 1 Indifference curves illustrating quasi-concavity, differentiability and essential goods.