So CCRs are of no less expressive power than semaphores. Obviously, they have no more expressive power than semaphores.

Question: Can you simulate a CCR by using semaphores?

5.3.1 Example - condition synchronization

We apply CCRs to the producer-consumer problem:

```
PROGRAM PCCCR; CONST
  BuffSize = ...;
TYPE
  ITEM = ...;
  BUFFTYPE = RECORD
               NextIn: integer;
               NextOut: integer;
               Count: integer;
               elements: ARRAY[0..BuffSize-1] OF ITEM
             END;
VAR
    Buff: SHARED BUFFTYPE;
PROCESS producer;
BEGIN
  REPEAT
    produce(product);
    REGION Buff WHEN Buff.Count < BuffSize DO
       place(product)
   FOREVER
END;
PROCESS consumer;
BEGIN
   REPEAT
      REGION Buff WHEN Buff.Count <> 0 DO
           take(product)
    FOREVER
END;
BEGIN (*main program*)
   (*initialize Buff*)
   COBEGIN
     producer; consumer
   COEND
END.
```

Drawbacks of CCRs

Though CCRs are an improvement on semaphores, they still suffer from shortcomings. For examples: