not based solely on its experience with bubble technology. The company, which is the second largest producer of integrated circuits in the United States, is going through a difficult period as a result of a general slackening of world demand for semiconductors. It has already reduced its 2,800 workforce in the United States by three per cent, and is closing its operations for a few days in both September and December to save money. Part of this general retrenchment involves phasing out several products, including the bubble memory devices, which achieved sales of only one million dollars last year.

Bubble memories work by storing information in the form of small polarized regions created in magnetic film. These appear as "bubbles" of magnetism, and can be forced along tracks by a pulsating magnetic field.

They have several advantages over more conventional memory systems, one being a potentially large capacity to store information. Intel announced in 1979, for example, a bubble memory capable of storing one million bits of information, while semiconductor manufacturers are still struggling to produce reliable chips capable of storing 64,000 bits.

Bubble memories are considerably faster than floppy disk storage. They are more reliable than magnetic tapes and disk storage since they have no moving parts. And unlike silicon chips, they do not lose stored data during power failures.

Against these advantages, however, several factors have handicapped bubble memories in the market. For a start they tend to be considerably slower than silicon chips. And while research and development into bubble memories has been aimed at improving their performance, the price of competing systems has been falling at such a dramatic rate that the advantages of bubbles have been insufficient to achieve the volume sales necessary to reduce prices.

While the price of floppy disk storage fell from about 0.04 to 0.01 of a cent for storing a single bit of information between 1977 and 1981, and random access memories from 0.08 to 0.02 over the same period, the cost of bubble memories remains an order of magnitude higher.

Compounding the price disadvantage have been apparent marketing failures by several of the companies. Both Rockwell and Texas Instruments are said to have concentrated excessively on refining the technology of bubble memories while neglecting the ancillary equipment necessary to make them as easy to use as conventional memory systems.

Supporters of bubble memory technology now admit that they are unlikely to overtake the market position of either disks or silicon chips. Where they are more likely to find a niche is in specialized applications where they can capitalize on their particular advantages, for example in defence or factory equipment operating in particularly harsh conditions.

Another potential application is in telecommunications. However, even Bell Laboratories, which pioneered bubble memories in this field admits to frustration in persuading its parent body, American Telephone and Telegraph, to replace disks with bubbles in telephone switching systems. Initial projections that this would take place in the early 1980s have now been put back "two or three years".

David Dickson

New antibiotics

Combined attack

If the hopes of the British pharmaceuticals company Beecham are realized, a quiet revolution in antibiotic treatment began yesterday (Wednesday 16 September) with the launch of Augmentin on the UK market.

Although in no sense approaching dangerous levels, there is a steady increase in the proportion of pathogenic bacteria possessing resistance to the widely used beta-lactam (penicillin and cephalosporin) antibiotics. Already several drug companies have responded by introducing so-called "third generation" cephalosporin derivatives (such as cefotaxime (Claforan) from Roussel and moxalactam (Moxam) from Shionogi and Eli Lilly) which are less susceptible to inactivation by the beta-lactamase enzyme present in resistant bacteria. These new cephalosporins, which have a much wider spectrum of activity than the "older" beta-lactam drugs, are being touted as an alternative to combinations of "old" penicillins or cephalosporins with aminoglycosides or some other antibacterials such as chloramphenicol or metronidazole for treating or preventing surgical infections.

Where the new cephalosporins fall down, however, is in the route of administration — they must be given by injection and not orally. In general practice, and for patients not hospitalized, oral administration is much preferred. Because Augmentin is claimed to have at least as broad a spectrum as the new cephalosporins, and can be taken orally, there is already great interest in the drug.

Augmentin is a novel combination; it contains a well established semisynthetic penicillin (amoxicillin) together with clavulanic acid which has no antibacterial activity of its own, but blocks the activity of the beta-lactamase enzyme in bacteria resistant to conventional penicillin therapy. Now this combination has been cleared for sale in the United Kingdom, and the Committee on the Safety of Medicines has now permitted Beecham to recommend its use in most of the infections for which the company had requested clearance.

The attraction of a broad-spectrum antibiotic is that it stands a good chance of being effective when used as an initial treatment, before there has been time to go through the process of identifying the infecting organisms. And this, of course, is usually the case in general practice. Augmentin is indicated for virtually any bacterial infection provided the bacteria are sensitive, and that means in about 95 per cent of cases. Comparable figures for resistance to cotrimoxazole and ampicillin or amoxicillin are around 84 per cent and 72 per cent respectively.

Applications for Augmentin to be allowed onto other markets, including Europe and the United States, are in the pipeline. The next step after that is to make a grade of Augmentin suitable for use in children (the present one is not), and then perhaps injectable forms will be introduced to compete with the third generation cephalosporins for treating surgical infections.

Charles Wenz

California's Medflies

Who to blame?

Washington

Now that the State of California seems to have brought its recent outbreak of Mediterranean fruit fly under control through intense spraying with the pesticide malathion, a sharp dispute has broken out over what — and more importantly, who — was responsible for an outbreak that at one time seemed to threaten not only California's multi-billion dollar fruit industry, but also the political career of Governor Edmund G. (Jerry) Brown.

Last week, officials of the state's Department of Food and Agriculture issued a report laying the blame squarely at the feet of the federal government. According to department head Richard E. Rominger, the outbreak would have been contained much earlier and without the need for aerial spraying had it not been for the accidental release of over 50,000 supposedly sterile flies by the US Department of Agriculture (USDA), some of which were later shown to be fertile.

However, USDA is refusing to be identified as a principal culprit. A representative of the agency said in Washington last week that although some non-sterile flies were "probably" released by mistake, it was impossible to tell whether this was the main cause of the outbreak since only two fertile flies were discovered among 1,300 dissected, the rest having been found to be sterile.

USDA is also pointing to an apparent laxity in quality controls supposed to check on the sterility of the 8,000 million irradiated flies imported from Peru in an attempt to apply biological pest control methods, for which the state was jointly responsible. USDA protocols suggest that several dozen flies from each batch should be checked for sterility. But in the rush to control the outbreak "the program personnel from both the federal and state agencies decided that only one insect should be checked (from each bag) so the state is really equally to blame".

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