tion scheme may not work all that well in imperfect, "real-world situations" because the Genesis 2000 makes its base determination from two channels of information versus four with the ABI 370A. He adds that under ABI's system the reagents cost about 1½¢ per base sequenced, whereas using DuPont's technique could turn out to be somewhat more expensive because the researcher needs to supply an overabundance of labeled dideoxynucleotides.

Rudy Dam, a research associate in DuPont's engineering lab and also one of the developers of the Genesis 2000, counters that DuPont's method of taking ratios of two channels of information does indeed allow accurate base determination. In fact, with DuPont's higher signal-to-noise ratio, he believes the performance of the Genesis 2000 will prove superior to that of ABI's equipment. As for the cost of the reagents, Dam reports that DuPont expects to be cost-comparable with ABI.

At this point, just one fact seems clear: As scientists look to the mammoth sequencing tasks ahead, automation is the obvious way to go. Only when the Genesis 2000 joins the 370A on the market, however, will researchers be allowed—and, in fact, forced—to make a choice. And this determination will be made even more difficult because both systems are continually being modified and improved. **—Arthur Klausner**

PRIVATIZATION OF NSDO AND PBI

UNILEVER BUYS INTO U.K. PLANT EXPERTISE

LONDON—The slow and painful process is over. On September 30, the U.K. government's National Seed and Development Organization (NSDO) along with half of the Plant Breeding Institute (PBI) in Cambridge will have passed into the hands of Unilever PLC (London) in exchange for $105 million.

Unilever, which markets consumer goods ranging from margarine and frozen peas to soap powders and instant desserts, beat out short-listed rivals Imperial Chemical Industries (London) and Booker Seeds (Seaford, Lincolnshire, U.K.). The British/Dutch giant gains both the company set up by the government to produce and market new seed varieties, as well as the breeding programs at PBI that provided most of NSDO's varieties. The combined activities of PBI/NSDO generated $18 million in income last year with a $7 million operating profit.

But Unilever does not get either the oilseed rape breeding program of PBI—which has been awarded to Agricultural Genetics Company (Cambridge) in return for its loss of rights covering the rest of PBI's plant breeding programs—nor does Unilever receive PBI's plant sciences program, which will now be transferred to the Institute of Plant Science Research (Norwich).

The acquisition of PBI/NSDO and their combined staff of 180 represents a major expansion of Unilever's interests in seed production and sales. The company will move its existing pea- and bean-breeding programs from its Colworth, Bedfordshire, laboratories to PBI, whose current interests in wheat, barley, and potatoes will be maintained. The plant tissue culture research at Colworth, which had recently seemed in some danger of being axed, will also be transplanted.

One of Unilever's goals is to make wheat both resistant to major U.K. cereal diseases and also more suited to the needs of millers. If this is to be achieved by means of genetic engineering, the company will have to strengthen its research in that area. Its pioneering work at Colworth on cloning oil palms, however, does give Unilever considerable experience in plant cloning techniques.

Privatization of PBI/NSDO has been widely condemned by U.K. plant scientists for forcing a separation between an effective combination of molecular biologists and plant breeders. It will take many years to recreate the special interaction that had been developed at PBI, said one of its leading scientists earlier this year. The researcher described the sale as an example of political shortsightedness. **—Peter Newmark**

DISCLOSURES

RATHMANN'S COMPETITIVE 'WARNING SIGNS'

NEW YORK—At the recent *Bio/Technology* executive seminar on "Assessing Competitive Strength," Amgen (Thousand Oaks, CA) president George Rathmann presented his views on some of the "questionable" statements that biotech companies have been known to issue. Among his list of "warning signs" are comments such as:

- "Total market potential"—Rathmann questions whether this figure always represents a market segment that the firm's product can actually address.
- "Patents have been filed"—This in itself is not particularly hard to do, so it doesn't necessarily mean anything important.
- "An overseas patent has been issued"—But in what country, and covering what? Also, this should still not be major news because the foreign patent claims have already been available for study.
- "We've obtained U.S. patent coverage."—Again, more questions need to be asked: How valid is it? How important is the patent? What is the background?
- "We have orphan drug status." But, as Amgen well knows with its erythropoietin, a company doesn't *really* have orphan drug status until such time as the firm becomes the first to have a product license application approved. Also, with Genentech (South San Francisco, CA) and Eli Lilly (Indianapolis, IN) fighting it out over their "orphan" recombinant human growth hormones, the future of the orphan drug law itself is in doubt.
- "Regulatory approval will be requested to start clinical studies."—Rathmann says such a statement should set off alarms because "most people are not so eager to tell the world exactly when they might be about to file for regulatory approval to start clinical studies." More important would be disclosures about the *results* of clinical trials.
- "All programs are meeting milestones"—Rathmann likened this statement to "giving the coach a vote of confidence before he takes another job."
- "A major pharmaceutical firm has licensed this technology."—This may well be a positive event, particularly if the major pharmaceutical firm says it is important. But it is still crucial to determine the *terms* of such an agreement in order to estimate its value to the biotech company.

According to Rathmann, the best way to assess biotech companies is to look for "documented performance versus documented forecast," to seek validated information (such as third party references), and to determine scientific stature, commitment, and stability.

But no one claims this is easy.

—Arthur Klausner