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Corporate Venturing: The Origins of Unilever's Pregnancy Test

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The relative ability of different sizes of firm and organisational designs to develop and sustain dynamic capabilities in innovation and create new businesses remains a matter of contention. While Chandler among many others has emphasised the pre-eminent role of large corporations as the engines of innovation over the last century, during the 'high tech' boom of the 1990s new business creation was strongly associated with entrepreneurs, start-ups, venture capitalists and angel investors. This is exemplified in the case of both the internet and biotechnology sectors. This article explores the issue of corporate innovation using a case study of new business creation within a large, established, multinational corporation. Large corporations are known to face obstacles to innovation from technological and resource lock-ins, and routine and cultural rigidities. The literature currently suggests a number of organisational solutions to this problem.

Unilever has, since its creation in 1929, been one of Europe's largest consumer businesses, and is known in Britain for consumer brands such as Persil detergents, Flora margarine, Walls ice cream and Birds Eye fish fingers. This study focuses on this company's development of the successful home pregnancy test, Clearblue, which was launched in Britain in 1985. Clearblue was a radical technological innovation which, equally importantly, departed from Unilever's traditional markets. The focus on Clearblue casts fresh light on the problems of new business creation within large corporations and allows in-depth investigation of one organisational solution to those problems. Moreover, by analysing the conditions that contributed to the success of Clearblue, this study seeks to deepen understanding of the product innovation process within these distinctive environments.

Innovation is widely recognised to be a highly contingent process, influenced by many and varied factors: this case study of Clearblue affords an opportunity to characterise those factors that proved decisive to its success. The limitations of case studies are more than familiar to business historians, nevertheless, the employment of the methodology in regard to Clearblue yields compelling insights into key aspects of new business development and innovation within Unilever which might otherwise prove difficult to identify.

II

In recent years entrepreneurs and start-ups have been the main focus of attention in understanding new business creation. In the United States, over the past 20 years small companies have accounted for two-thirds of all new jobs created in the private sector. During the same period, employment in the *Fortune 500* has declined by five million jobs. One recent study suggested that one-third of the differential in national economic growth rates was due to the extent of entrepreneurial activity.¹

A different emphasis is found in the Chandlerian tradition in business history which assumes the central role of the large managerial firm as the main engine of innovation, at least in the Second Industrial Revolution. These large firms possessed, as Chandler describes in *Scale and Scope*, 'the facilities and skills – the organisational capabilities – that simply were not available to new entrepreneurial entrants into an industry'. This enabled them to develop products for new markets sometimes far removed from their original concerns. Thus, Chandler continued, 'it was the established firms, not the new ones, that carried out the revolution in pharmaceuticals which began with the introduction of sulfa drugs and penicillin'. The modern industrial enterprise, he concludes, was 'entrepreneurial and innovative in the Schumpeterian sense'.² In his most recent work on the consumer electronics and computer industries, Chandler has explored this theme further and has placed great emphasis on the importance of the learned capabilities of large 'core' companies who had been first movers, against whom subsequent entrepreneurial start-ups rarely made headway.³ Patent data support this view, and point to the overwhelming importance of large firms in innovation. In the 1990s the world's 700 largest industrial firms accounted for around half of the world's commercial inventions as measured by patent counts.⁴

While emphasising the importance of large firms, Chandler and others do not propose that size and managerial control were sufficient to make a firm effective with regard to innovation. New business creation comprises a number of distinct stages: the identification of a new product concept; the validation process leading to a decision to launch – or not – the product; the creation of an organisation to manufacture and sell the new product; and the institutionalisation stage, which is absent in the case of unsuccessful ventures. All these stages involve risks and dangers, and all types of firm experience problems during them. 'Even in many very successful companies', one landmark study observed in 1992, 'new product development is tinged with significant disappointment and disillusionment, often falling short of both its full potential in general and its specific opportunities on individual projects'.⁵ Not surprisingly, there is a formidable literature, from a range of disciplines and looking at different units of analysis, which seeks to explain why securing successful innovation from the accumulated knowledge of corporations poses such formidable managerial difficulties.⁶

Large established corporations face particular challenges arising from technological and resource lock-ins,⁷ and routine and cultural rigidities.⁸ The role

of corporate culture has generated a large literature. Teece has identified the 'emerging consensus' that certain cultural norms facilitate technological development. These include, in the development of new products, 'the autonomy to try and fail: the right of employees to challenge the status quo; open communication to customers, to external sources of technology and within the firm itself'. In the commercialisation of innovation, Teece considers 'teamwork, flexibility, trust and hard work' as critically important.⁹

In terms of facilitating effective innovation, cultural norms can be either a strength or a weakness. Typically, established companies have, by their nature, traditional ways of behaving and thinking, developed over time and passed on through successive generations of managers, but which may not be compatible with the experimental and ill-defined early stages of new business creation. Large, established firms may well be intolerant of 'disruptive' individuals who often articulate or pursue new ideas. Organisations geared towards efficient and predictable operations, perhaps accustomed to more conservative, cumulative change, might also be less amenable towards or able to provide the more entrepreneurial, risk-taking, environment within which new businesses can be developed and launched.¹⁰ Such companies may also be more cautious if they feel that they lack appropriate market knowledge, especially where a radically new business is under consideration.¹¹ New businesses can be launched simply to commercialise new technologies, rather than to meet market needs.¹² A new business may cannibalise an existing customer franchise, while entrepreneurial start-ups tend to have low entry costs, as they typically begin in workshops or other modest environments.¹³

The importance of routines and culture has emerged in several historical studies. Graham and Schulder, in their study of 150 years of innovation at the US-based Corning, have argued that managerial hierarchies and economies of scale were less important in promoting technological innovation within firms than a culture which fostered 'independent thinkers who are also team players, creative relationship building via giant ventures and strategic partnerships, and the continuous generation, management and deployment of intellectual property as a strategic asset'.¹⁴ Corning was a medium-sized, family-owned company which progressively 're-invented' itself from a speciality glass manufacturer in the nineteenth century, to being a leading producer of television tubes after the Second World War, to becoming one of the world's largest fibre optics manufacturers.

Acute political issues frequently arise within, indeed perhaps typify, large managerial bureaucracies. Commonly, within such environments, new businesses need senior executives to act as 'champions' to protect them through the early stages of development to launch. This is all the more critical since, initially, new businesses will frequently be loss making.¹⁵ Yet, within established large corporations, those seeking to develop new business may encounter difficulties in gaining access to senior executives. In turn, such internal structural barriers render more distant the likelihood of entrepreneurial talent being able to

convince those powerfully placed within an organisation to support, or 'champion' the new venture. At the same time, but less commonly, large companies with their vast financial resources may tend to complacency about the poor performance of a new business, and find themselves supporting a loss-making enterprise for longer than is advisable.

There remains no agreement on the best organisational solution to the problems of innovation within large corporations. One stream of literature suggests that dynamic innovation can only be achieved by the creation of independent spinouts.¹⁶ Others suggest that different innovation streams can exist within large corporations and enable them to change continuously.¹⁷

The creation of internal venture units provides one means to escape the inertia of existing organisations.¹⁸ Already in the decades after the Second World War, many large corporations began to respond to the perceived maturity of their traditional markets and their own declining levels of innovation by seeking new organisational means to facilitate new business creation within their own boundaries. It was too daunting to contemplate a transformation of the entire organisation, and instead attention turned to trying to make or create more entrepreneurial components within it. During the 1960s Du Pont utilised both its existing divisions and a Development Department to create new ventures.¹⁹ During the same period internal venture divisions were created within many large US corporations, including Gillette, IBM and Xerox. European companies, while equally interested in diversification, were less inclined to establish specific units for new business creation, although their strategies are less well-researched. There were cases, however, including BP's establishment of a BP New Ventures department in 1974, designed to take over responsibility for developing activities other than oil and coal.²⁰

Relations between such autonomous entrepreneurial units and the large organisation frequently became fraught with difficulty, so that such arrangements were often short-lived and yielded only limited results. The Du Pont 'new venture' initiative was considered a failure by the end of the 1960s. In 1978 it was estimated that 30 of the largest 100 US industrial companies had adopted such units, but almost all of them had either been disbanded after a few years, become an operating division covering the new business, or had acquired a new function.²¹ One study at the end of the 1980s of 33 of the US's largest corporations, including Du Pont, Exxon and Procter & Gamble (P&G), reported that over two-fifths of their internally generated start-ups and 50 per cent of their joint ventures were divested or closed in their first six years.²² Venture managers were often 'orphaned' and not effective in the parent firm's internal politics.²³ Large corporations have continued to create new venture units. In 1994, Procter & Gamble formed one such unit, which remained in operation in 2004, although on a much reduced scale. More recently, some firms have preferred to establish corporate venture capital funds to provide an environment physically removed from the parent company. However, again, such measures have, typically, failed to survive in the longer term. Moreover, unlike independent venture capitalists,

they have suffered from the constraint that they have been expected to invest in businesses related in some way to their parents.

III

Unilever was formed in 1929 by a merger between Lever Brothers, a pioneer of branded soap manufacture founded by William Hesketh Lever (later Viscount Leverhulme), and the Margarine Unie of the Netherlands. The Unie had itself been formed from the merger of several leading Dutch margarine manufacturers, including Van den Bergh and Jurgens, Hartogs' meat business at Oss, and the central European firm of Schicht. Following the merger in 1929, Unilever adopted a structure of two holding companies, one British and capitalised in sterling, and one Dutch and capitalised in guilders, though with identical Boards and an 'Equalisation Agreement' between them provided that they should at all times pay dividends of equivalent value in sterling and guilders. The dozens of 'operating companies' for individual countries and product categories remitted their dividends to either the British or the Dutch parent company. Companies acquired by Unilever often retained their former names – such as Wall's – and considerable autonomy, even though all used common Unilever financial reporting and personnel systems. At the apex of Unilever's organisation were two chairmen, based in separate head offices in London and Rotterdam. The chief executive function was performed by a three-person Special Committee, comprising the British and Dutch chairmen and one other director.²⁴

Soap and margarine, both initially derived from oils and fats, remained at the heart of Unilever's business during the post-war decades, but Leverhulme began a process of diversification. His investments in West African trading and plantations, initially seeking security of raw material supplies, led to the ownership of the giant United Africa Company (UAC), formed at the end of the 1920s, which became one of the largest modern business enterprises in Africa. During the 1920s Lever Brothers also diversified into ice cream and sausage manufacture, fish shops and trawling fleets, and tinned salmon. After the merger with Margarine Unie in 1929, Unilever continued to diversify. The profits from Unilever's large German business, trapped by Nazi controls over dividend remittances abroad, were invested in cheese, ice cream, hair dyes, and even shipping companies. Unilever's expansion continued even during the Second World War. In the United States, Unilever acquired T.J. Lipton, a leading tea company, followed in 1944 by the Pepsodent toothpaste company. It also acquired from a US firm the right to manufacture and sell in Britain quick frozen foods under the Birds Eye name. Unilever acquired Batchelors Peas, one of Britain's largest vegetable canners, in 1943.

The 1950s saw further product diversification now stimulated by perceived threats to the oils and fats businesses. Margarine and soap and detergents still contributed around one-half of Unilever's worldwide profits, yet both businesses were in mature markets, and faced considerable and increasingly pressing

challenges. In the case of margarine, Unilever's commanding position is illustrated in market share data for 1958: in Britain, the Netherlands and Germany the company held 67, 69 and 71 per cent market share respectively. However, the company was acutely aware that the market for yellow fats was not growing. Consumption was static or falling for various reasons, including slowing population growth, expanding production of convenience foods, and rising health awareness which drew attention to the deleterious effects of saturated fats. This gave rise to growing consumer preference for margarines rich in polyunsaturated fats (pufa) and for which, importantly, many consumers were prepared to pay more. From the mid-1950s onwards, Unilever lay in the vanguard of segmentation of the European margarine market, developing a range of low fat and high pufa products that also offered improved quality in terms of texture and taste. The aim was to expand market share against butter, which continued to account for almost three-quarters of the British yellow fats market at that time. New brands were launched aimed at different market segments which emphasised health benefits and at the same time sought to counter margarine's image as a cheaper and inferior version of butter.

In soap and detergents Unilever's main problem was competition in its European markets from other major international firms, P&G, Colgate and Henkel. P&G took the lead in the development of synthetic detergents, sweeping the US market in the late 1940s, and then using its advantage in synthetic detergent technology to attack Unilever's once commanding market share in European laundry detergents, dishwashing liquids, bar soaps and cleaners. Unilever remained committed to soap, and as a result fell behind in the new technology. The lag in synthetic detergents put Unilever at a major disadvantage in the immediate post-war decade, although by 1965 over half of its detergent sales were synthetic.²⁵ Subsequently, P&G's application of enzyme technology provided the basis for its large-scale entry into the German market in the 1960s. Unilever held over 40 per cent of the German detergents market in the early 1960s, just behind Henkel, but the entry of P&G had a disastrous long-term effect on its business, shrinking its share to barely over ten per cent within two decades. In the giant American market, Unilever suffered a prolonged decline in market share, and by the mid-1970s its main US affiliate, Lever Brothers, had become loss-making.²⁶

A key element of Unilever's strategy from the 1950s, therefore, included reducing the company's dependence on margarine and soap and detergents – while maintaining or, where possible, growing market share in these traditional markets. The expansion of Unilever's presence in foods, creating a so-called 'third leg', became a top priority. Unilever pioneered the introduction of frozen foods into Britain and elsewhere in Europe during the 1950s, and towards the end of the decade began to build a European-wide ice cream business. During the 1960s it also began to seek ways to expand its tea interests, which were then confined to T.J. Lipton's business in the United States. There was a long-term desire, which remained largely unfulfilled until the 1980s, to expand the small

personal care business, at that time largely restricted to toothpaste and shampoos. Meanwhile, other parts of the business also began to grow. These included packaging, road, river and ocean transport, chemicals, and market research, all of which had begun primarily as service businesses to other Unilever companies, but which were encouraged to seek 'third party' business.

Unilever sought to diversify through both acquisition and innovation. The expansion of the European ice cream business, which before 1958 was confined to Britain and Germany, was largely achieved by buying national-based ice cream businesses elsewhere, which were then restructured.²⁷ During the 1970s, UAC, strengthened by profits from oil-rich Nigeria, yet anxious to diversify beyond politically risky Africa, also acquired numerous small and medium sized companies in Britain and France, in activities ranging from garden centres to office equipment.²⁸ Elsewhere, the acquisition in 1978 of National Starch in the United States – which was, at that time, the most expensive acquisition made by a European company in that country – transformed Unilever's small speciality chemicals business into a market leader which provided major profit stream for the company.

Innovation provided the second means of diversification. Unilever was among the largest corporate spenders on research within the world consumer packaged goods industries, and was in the top 20 corporate spenders on research in Britain in 1945.²⁹ During the 1950s, Unilever added to its main laboratory at Port Sunlight by opening laboratories at Colworth in Bedfordshire, Vlaardingen in the Netherlands, and in India. Although Unilever was a highly decentralised enterprise, research was designated a 'central' function, alongside Finance and Personnel. Unilever research was organised in two main components. The Research Division controlled 'central' laboratories, and was funded by a percentage levy on the sales of Unilever's numerous operating companies, which made and sold its products in national markets. There were also a large number of 'in-house' facilities including factories, workshops and small 'application-oriented' laboratories located within the operating companies. By 1980 over 7,000 people were employed in Unilever's research laboratories, which were spread over Europe, the United States and elsewhere.³⁰

The expansion of the research function at Unilever from the 1950s onwards reflected a wider climate in which there were high expectations that research would lead to innovation and so provide a source of growth and new business. From the late 1950s, Unilever research and researchers built international reputations for excellence. Over the following decades, Unilever was responsible for many innovations that spanned the range of its diverse business interests: frozen foods, detergents, toothpaste and other product groups benefited from a constant stream of incremental innovations. In regard to margarine, for example, there was a consistent flow of innovation originating from Unilever's nexus in the Netherlands, consisting of the Vlaardingen research facility and a large margarine factory in Rotterdam which provided the knowledge base for the segmentation of the margarine market.

However, Unilever's experience in many ways exemplifies the problems of new business creation in large corporations. While it is not evident that this large and multi-product company was handicapped by technological or resource lock-ins, routine and cultural rigidities were very evident. It was apparent by the 1950s that Unilever encouraged 'defensive' research which focused on protecting existing market positions. In 1959 one analysis estimated that no more than ten per cent of Unilever's research spending was allocated to new product development – the bulk going on so-called 'protective' or 'modification' research aimed at maintaining existing market positions. The budget for central research was calculated as a percentage of sales in a specific area, so research in the existing largest product areas received the largest share of resources. A culture of caution meant that innovation tended to be incremental and continued in the main to lie within the company's 'core' markets. Radical innovations remained unlikely not least because operating companies were usually not interested in developing and marketing concepts far beyond their existing product lines.

The perception emerged in the early 1950s that both the pattern and pace of innovation were problematic, and in the ensuing decades Unilever contemplated or implemented a number of solutions to these problems. In 1959 the Research Director, Ernest Woodroffe – a future Chairman of Unilever – proposed the creation of a 'cradle company', the role of which would be to foster new products.³¹ This early proposal for a form of internal venture unit was not pursued, probably because it ran counter to Unilever's tradition of decentralisation. Rather, it was decided to make greater financial provision for 'basic' research which it was hoped would improve the flow of new products. Translating basic research into products is a universal and seemingly intractable problem for all types of business and certainly, at Unilever, there was persistent unease about the slowness and efficiency of the transition from basic research to marketable products. In 1972, a McKinsey consultancy report on 'Achieving Profitable Innovation' concluded that despite a level of spending which matched its competitors, Unilever was 'not a consistent leader in significant innovation'.³² 'History showed us to be always very slow at getting results', the Special Committee noted a decade after the McKinsey report, 'and we must develop some mechanism for reaching objectives as fast as possible'.³³

Unilever's difficulties regarding what were perceived as poor returns on R&D investment, in terms both of achieving new business creation and the pace/scope of innovation generally, were grounded in several 'systemic' features of the company. Within Unilever's highly decentralised structure, for example, the constituent operating companies had enjoyed a large degree of autonomy, especially concerning key decisions about the allocation of R&D resources and over their particular product range. The considerable resistance within the operating companies to close direction from the head offices made for difficulties when it came to developing new ideas for new products originating from within the centrally controlled research function. Moreover, there was a

reluctance to prioritise spending, including on research, between different parts of the business. Those charged with guiding the innovation process had to steer a course through the Research Division, the research laboratories, the product groups created from the 1950s (known as Co-ordinations), which from the mid-1960s had profit responsibility in Europe, and the Special Committee. The separation of the research and marketing functions further compounded the difficulties Unilever faced as it sought to achieve effective innovation. Historically, Unilever's strengths lay in 'brand building', and it is unsurprising that the company is frequently characterised as being marketing- rather than science-led. That Unilever was marketing-led, and that marketing and research were divorced from one another, rendered the improvement of innovation particularly challenging. Weaknesses in internal communications were both specific and generalised, and had far-reaching implications. As the author of one internal investigation into Unilever's lack of an 'outstanding record for new product innovation' noted in 1973, 'even within management groups, communication of new ideas may be delayed or inhibited by inter-company rivalry. Between management groups, new product concepts may become secret weapons in demarcation disputes with consequent duplication of effort'.³⁴

Equally, Unilever's corporate culture, which placed emphasis on building relationships and rested on consensus, created an environment that militated against the driven, individualistic managerial style characteristic of risk-taking entrepreneurship and new business creation. A report on Unilever's management culture in 1982 observed that there was 'too much emphasis on information and consultation', and that managers were 'too concerned with discussion and evaluation of all options to the detriment of the entrepreneurial spirit'.³⁵ Organisationally and culturally, Unilever found itself poorly placed to respond to the challenges it faced as its key markets came under pressure. This, in turn, engendered growing concern over the company's seemingly intractable difficulties regarding the efficiency of its research and innovation activities.

The high degree of diversification of Unilever compounded the problems the company faced as it sought to develop a cohesive innovation strategy. The constituent businesses were often differentially sensitive to science and technology, and had vastly different research requirements which changed over time. They were especially suspicious of basic research which rose to heightened prominence in 1970 with the creation of what was termed the Central Research Fund (CRF). This assured financial support for longer-term 'basic' research, and was launched using the slogan 'New Science for New Business'. The CRF was viewed by its advocates as the means by which the company might improve its innovation record and break into new markets. The CRF was controversial within Unilever at the time because it derived funds from a levy imposed on the Co-ordinations which amounted to ten per cent of their total annual research budget – a not inconsiderable investment – and over which the Co-ordinations complained they could exercise little control. The funds were to be used specifically to support basic research that would be conducted in the central

research laboratories. Later, in 1976, it was decided to allocate 25 per cent of the Central Research Fund for use in 'exploring and evaluating' any ideas emerging in the laboratories.³⁶ However, there remained persistent problems in translating basic research into new businesses.

Nevertheless, the organisational constellation acted as a 'closed system'. Unilever distrusted collaborative ventures with other firms, especially when those firms had links to its competitors, which meant little effort was made to tap into outside sources of technology available from larger suppliers. The extent to which the culture of self-reliance, coupled to the internal divisions and communications problems already discussed, contributed to the company's continuing problems with innovation remains open to speculation. Certainly, Unilever was not alone in facing these difficulties – although its size, diverse markets and geographical reach may have ensured that the challenges it faced were more acute than was the case for many of its competitors. However, the company was reflexive about its shortcomings in innovation and many within the company both recognised and were critical of the internal factors that contributed to the innovation problem.

Unilever experienced several setbacks as it sought to innovate. During the 1960s, considerable time and money was spent on developing longer life yoghurt, and during the 1970s even more effort was devoted to a large-scale project on disposables, including feminine hygiene products. In both cases Unilever eventually abandoned the projects after launching products. The failure of the 'Hyacinth' project on female sanitary protection to deliver marketable products – it was eventually abandoned in 1980 after over £15 million had been spent with little in return apart from some test marketing of tampons in various countries – led to particularly strong disillusionment among senior executives concerning Unilever's capabilities in new business creation. The lesson the Research Director got from the episode was that 'The whole exercise had demonstrated the difficulties of starting new activities based on findings in research that lay outside Unilever's traditional range and ... raises the question of whether the Concern is properly organised to deal with diversification of this sort'.³⁷ Tellingly, such setbacks were heavily criticised by some, and cited to question the wisdom of straying too far from Unilever's traditional markets. Such responses reveal much about the 'risk averse' climate that continued to prevail within the company. Seemingly, and for manifold reasons, Unilever's ability to develop new markets, create new businesses and translate basic research into marketable products remained as problematic in the 1980s as it had done 20 years earlier.

IV

Within this context, Unilever's development of a new medical diagnostics business stands out as a case when the company was able to translate 'basic' scientific research into a successful branded product in a sector well beyond its

traditional expertise and markets. The Clearblue pregnancy test kit was the flagship product with which Unilever entered the 'over the counter' (OTC)/'need to know' healthcare market.

Clearblue employed monoclonal antibody technology to detect and visualise the hormone Human Chorionic Gonadotrophin (HCG) in urine, the presence of which serves as a positive indicator of pregnancy. The science on which Clearblue was based had a long pedigree stretching back to immunological research undertaken during the 1970s for Unilever's animal feeds business. A Microbiology Section had been established at the Colworth laboratory in the mid-1960s where research commenced into enteric diseases of pigs, and more specifically the problem of post-weaning diarrhoea in piglets. This caused high mortality rates of around ten per cent, and represented a potentially lucrative market for any company able to develop a solution for it. Over a number of years, the Unilever researchers established that the causative agent was the bacteria *Escherichia coli*. On the basis of this research, the concept of an antibody-based solution was developed involving vaccine stimulation of antibody production with the vaccine administered as an in-feed additive. The system was patented, and a dry feed product launched successfully as Intagen in 1975.

A recruitment drive in the early 1960s, strategically undertaken to strengthen Unilever's science base, brought an influx of young researchers, including the British-born immunologist Philip Porter. Porter had a Ph.D. in immunochemistry from Liverpool University, but was then teaching in Chicago; on joining Unilever, he became centrally involved in the Intagen project. Subsequently, however, Unilever failed to build on this commercial success; the further development of immunology-based products for the Animal Feeds Co-ordination was limited, but included, for example, Soycomil, which was aimed at the young animal nutrition sector of the livestock market. Porter later ascribed the failure to build on Intagen to Unilever's 'fear of pharmaceuticals ... that restricted the pickings from the Intagen research'.³⁸ Porter continued his own career within Unilever and went on to conduct groundbreaking research on the role of plasmids in disease virulence. An immunology department had been established at Colworth in 1971 which was initially closely associated with the Intagen project; later however, Porter was to bring his immunology expertise to bear in a markedly different context.

Elsewhere, another part of Unilever, the UAC, had diversified into medical products during the early 1970s, building on its experience owning pharmacies in West Africa. A number of small British companies were acquired, and laboratory equipment identified as a growth area. Its Medical Division launched Sensititre, a diagnostic kit that assessed the strength of antibiotics, in 1978.³⁹ This was a disposable antibiotic disc for use in hospitals or doctors' surgeries for rapid identification of bacterial infections as an aid to diagnosis. The immunology laboratory at Colworth assisted UAC in developing this product at a factory in East Grinstead, where various personal care products were made for the African market.

Colworth and UAC also formed collaborative links with Birmingham University that led, in 1978, to the launch of the Immunostics range of antibody products.⁴⁰ Colworth built on the discovery in 1975 by scientists at the Medical Research Council of monoclonal antibodies (MCA) – molecules that recognise only one type of antigen, a specificity that could therefore be exploited to target a defined antigen.⁴¹ MCA technology became central to Colworth's immunodiagnostic research programme, and in 1980 Porter and his colleagues filed the Paired Monoclonal Antibody (PMA) patent, which protected the ground-breaking technique of using two monoclonals of narrow and different specificity to bind different sites of an antigen. Research continued apace, giving rise, for example, to the development of improved non-isotopic assay systems, liposome-based assays, solid phase technology, immunoprobes, peptide assays and 'Immunostix' peg technology – specially moulded nylon pegs, fitting standard laboratory equipment, that became routine within immunology laboratories across the world. Most notably, Porter, together with Paul Davis, developed the ground-breaking 'dipstick' concept for an ELISA test, a simple, efficient one-step assay system, the basic principles of which were subsequently employed in Clearblue.

By 1980, although Unilever was at the forefront of the science of immunochemistry in the world, reorganisation and shifts in strategy then taking place in other parts of the company made it seem, at least for a time, that the achievement was fated to join the catalogue of unfilled potential seen elsewhere. Some harboured doubts about the competence of UAC to pursue a medical business. Indeed, the rapid deterioration of UAC's business in Nigeria – following the halcyon period of the oil booms of the 1970s – placed a question mark over its entire future within Unilever. Meanwhile, Unilever's decision in 1980 to disinvest its animal foods businesses outside Britain – where it was the largest manufacturer – led to a marked decline in funding for immunological research. The Animal Feeds Co-ordination, the mainstay of funding for immunology research, was eventually closed down two years later.⁴² In 1980, the future of immunological research at Unilever looked uncertain. It was from these less than propitious circumstances that a remarkable, if somewhat unlikely, success emerged.

The survival of research in this area, and its eventual translation into pregnancy testing, was heavily dependent on the support of a number of senior directors who became 'champions' within Unilever. Two key figures were the recently appointed Research Director, Sir Geoffrey Allen, a chemical engineer with a background in universities and government, and the Chemicals Co-ordinator, T. Thomas, also a chemical engineer by training, who in 1980 had been the first Indian national to be invited to join the main Unilever board after serving as chairman of Unilever's large Indian affiliate, Hindustan Lever. Both men believed that Unilever's science base had enormous potential which needed to be exploited more effectively to develop new businesses and create new businesses. At the same time, Porter's commitment to immunology research and

to the application of that research in the development of new products never wavered. He forged close links with both Allen and Thomas, and together the three men formed a formidable alliance that ensured the future of immunology research at Unilever and led the company into wholly new commercial territory.

The new Chemicals Co-ordinator initially approached the immunology team at Colworth concerning the potential use of monoclonal antibodies in creating a vaccine for population control, but, having realised that this was a distant prospect, became interested in other potential uses of Unilever's knowledge in immunology.⁴³ Thomas, like Porter, shared a vision of the vast commercial potential that immunological techniques offered, both scientifically and in terms of business opportunities. Early in 1981 he visited the Massachusetts Institute of Technology (MIT) and the State University of New York at Stony Brook in the United States to 'plan for immunology and its industrial application'.⁴⁴ A year later the Director of the Cancer Research Center at MIT made a visit to Colworth and concluded that 'in a number of areas' Unilever was 'ahead of the field'.⁴⁵ Thomas viewed the creation of a new business in medical diagnostics as extremely important for Unilever in a wider sense. It was necessary, he argued, 'to create new ventures within established businesses like Unilever to provide organic growth'.⁴⁶

Meanwhile, UAC continued with its Sensititre and Immunostics product ranges, and aspired to an acquisition in the United States. However, the Special Committee decided that UAC was the 'wrong vehicle' to develop the new technology, especially in the United States, and the acquisition was turned down by the Special Committee.⁴⁷ Importantly, it was decided not to abandon the expertise in immunology at Colworth. Rather, it was resolved that Unilever should try to create a business in medical diagnostics, not as part of UAC, but rather as a wholly new and separate group. Thomas and Porter, crucially with strong backing from Allen, spearheaded this initiative. A new group – the Medical Products Group (MPG) – was created in 1983, and placed under the jurisdiction of the Chemicals Co-ordination. From the outset the MPG enjoyed a large degree of autonomy and, significantly, scientists – Porter, Davis and others – took leading managerial and business development roles within the new group. The MPG formalised the medical diagnostics business within Unilever, and signalled a new commitment to it. It also spurred much product-oriented research with the aim of establishing MPG as an important player in the immunodiagnosics market.

The Special Committee acknowledged that, from its inception, Medical Products Group would be making losses for three to four years while building up 'necessary' knowledge.⁴⁸ Unusually, funds were provided from central corporate sources, a financial arrangement that accorded the MPG direct access to the higher levels of Unilever. New managers were recruited from other firms, including Beechams and Glaxo, and a small new R&D group was set up in a converted warehouse in Bedfordshire – near Colworth – headed by Porter. UAC's Swards laboratory was incorporated into the new Bedford laboratory,

and the medical diagnostics business relaunched as a new company, Unipath, formed in 1984. Over the following years Unipath was allowed to develop as a 'walled off' venture within Unilever, supported at the highest levels of the company – in part through a conviction that it was good that Unilever was doing something medically valuable – yet allowed to act with great autonomy.⁴⁹

From the outset, Unipath's strategy was 'to build a reputation as an advanced technology group with quality products'.⁵⁰ MPG was young and anxious to prove itself to its parent company and within the market. The prevailing culture emphasised both the scientific and the commercial: the laboratories were to be driven by the market. Researchers were given a brief with clear targets to the extent that 'from the mid-1980s onwards market specifications and project charters became the criteria to work towards'.⁵¹ Initially, research continued in a number of directions jointly with leading British universities and medical institutes, and suggests the outward looking, network building culture that became characteristic of MPG. An early emphasis on the application of monoclonal antibodies in the treatment of cancer was soon eclipsed by research in areas that were felt to offer stronger commercial prospects for MPG. Involvement in therapeutics, however, raised daunting regulatory, ethical and legal issues, consideration of which led Unilever to make a decision against entering into pharmaceuticals. Moreover, the hospital diagnostics market was dominated by a few large companies, mainly divisions of powerful pharmaceutical houses including Abbot, Bayer and Boehringer, with which Unilever had no desire to compete. Rather, attention at MPG focused on a shift within the diagnostics market away from large hospitals and clinics to smaller clinics and to the then small but growing OTC diagnostics market. Thomas and Porter saw in this trend an opportunity to apply MPG's biotechnological expertise and began to concentrate effort behind various OTC products in 'need to know' areas such as pregnancy, fertility status, cholesterol levels and status in regard to infectious disease. Always a keen advocate of commercialising scientific research, not least because it provided a means by which to offset the high cost of basic research, the Research Director, Allen, gave his full support to the shift in research emphasis that accorded priority to the OTC diagnostics programme. Now viewed as peripheral to the main thrust of MPG strategy, the loss-making Sensititre business was sold in 1984 to its American distributor, Gibco, after Unilever had failed to exploit its early lead and having seen its market share in the US slip to two per cent.⁵²

Strategy became centred on bringing one major commercial product to market – preferably within a year. In addition to the strategic importance of developing a 'lead product', speed to market was prioritised, firstly because competition in the medical diagnostics sector was intensifying, and secondly to ensure that MPG did not become a 'research boutique'. The OTC pregnancy test kit rapidly emerged as MPG's flagship product, which became the subject of a concerted research and marketing campaign. Clearblue was launched in June 1985, less than two years after MPG had been formed and 18 months after the

project had been conceived: the speed from concept to launch is rendered all the more striking when contrasted with the timescale that typified the innovation process elsewhere within Unilever. Clearblue was an immediate success, and within three months it became the market leader with a nearly one-third share of the British market. The following section explores the convergence of technological, cultural and organisational factors that shaped the innovation process within MPG and examines how these contributed to the success of Clearblue. Attention then turns to compare the ways in which the MPG environment differed to that found more generally within Unilever.

V

Although OTC pregnancy tests pre-dated Clearblue, the market was still in its infancy in the early 1980s. Anxious to exploit what it viewed as vast market potential in this sector, Unipath sought to develop a product that offered distinct and substantial advantages over the competition. Existing products were cumbersome, leaving plenty of scope to improve accuracy, reliability, ease of use and time taken to obtain a result.⁵³ Home ('inexpert') use dictated a need for simple easy-to-use systems. Product design and development therefore worked within a four-fold framework: simplicity, sensitivity, speed and specificity. When launched in 1985, Clearblue was more sensitive, faster and more reliable than its competitors: the test took 30 minutes and offered 99 per cent accuracy.

The Clearblue project allowed Unipath to take advantage of its leadership in monoclonal antibody technology and ready-to-use immunological reagents. This scientific leadership was translated into technological innovation: Clearblue incorporated several unique features that were critical to its success. Of singular importance here was the attention paid by Unipath to consumer feedback: focus groups identified preferences that were fed into the design process and incorporated into the final product. This identified a 'particular distaste' for dealing with a urine sample.⁵⁴ Urine collection therefore became an important focus in the design process and led to Clearblue's unique 'bucket' collection system that was both hygienic and non-invasive. The 'bucket' system, which was immediately patented, became Clearblue's 'unique selling point' and was widely acknowledged as being central to its success. The views of the (prospective) consumer were translated by Unipath into a competitive advantage that proved, in turn, critical in achieving market leadership. That the findings from consumer/market research were incorporated into the design process was made possible by the close links between research and marketing at Unipath – ties that were, from the outset, strategically cultivated.

Unipath was also able to draw on other capabilities available more widely within Unilever. In the course of design and development, problems of leakage emerged in the test kit packaging. OTC test kit reagents and packaging were required to remain stable for a shelf life of up to six months. Unipath was able to resolve such problems by drawing on expertise that had been built up during

Unilever's long-term involvement in food packaging. Both marketing and production managers were hired from other Unilever companies. There was also much consultation on technical issues. The physical chemists at Port Sunlight were consulted regarding the design of plastics, the chemistry of 'readout' systems for OTC kits, and the drying of absorbent wicks following the coating of test-kit components with surfactants. However, outside consultants were also used to acquire knowledge, and some appointments were made from outside firms, some more successful than others.

The factors that facilitated rapid innovation and the incorporation of consumer preferences into the design process were organisational, cultural and managerial. If new business creation within Unilever as a whole was impeded by the weak relationships between research and marketing, steps were taken at Unipath to avoid this outcome. A special marketing team, which included science graduates, was assembled by Porter and became an integral part of Unipath, separate from Unilever marketing. The head of the team subscribed to the view that 'science is no good without matching it to its users', and this approach drove the marketing strategy.⁵⁵ Critically, information flowed freely across the technical/marketing interface within Unipath, something that was generally regarded as crucial to the success of the company and its products.

Marketing was not only closely coupled to research, it provided the means by which Unipath carefully positioned Clearblue within the market, building for it a particular image in order to create its own 'niche'. The product was strategically targeted to appeal to the modern independent woman in control of her life, and emphasised the new possibility that she (alone) could have total control over the 'knowledge' of a pregnancy. Advertising often pictured a woman – in soft focus, in a private space, usually the bathroom – consulting the test outcome alone. Unipath was able to draw on the branding expertise elsewhere in Unilever to develop a strong brand image through 'extensive product support', including, for example, the creation of a distinctive 'Fan Device' trademark, which sought both to convey reassurance and suggest femininity. Media spend on advertising in the 'women's press' was £200,000 for the six-month period following launch. Elsewhere, other strategies included consumer information leaflets, and support for the 'trade' Clearblue display stand, trade advertising, staff training package and a comprehensive public relations campaign in the trade, medical and consumer press.

A more entrepreneurial culture at Unipath was also centrally implicated in its success and, perhaps tellingly, differed sharply from the cautious, consensus culture found elsewhere within Unilever at that time. Great emphasis was also placed on developing clear and open channels of communication within Unipath to ensure information flow across and between all elements of the business. This was particularly important between research and marketing, but it was also apparent in Unipath's wider relations, for example, with the external scientific community, and with Research Division and Unilever as a whole. As an internal history of the Clearblue project later described,

The group maintained strong networks with the external scientific community and with key opinion leaders. The group also attended as many external conferences as possible. The team was not at all inwards looking and aimed to acquire information in order to enlarge the vision. The team had many opportunities to present to senior people within the organization. A close relationship with the operating company was maintained through frequent contacts.

This outward looking philosophy contrasted with that often found elsewhere within Unilever. Untrammelled by tradition, Unipath drew confidence from its expertise in immunology and from the belief that it possessed the requisite skill base needed to commercialise that science. From junior ranks to senior management, the culture within Unipath emphasised innovation: 'the team benefited from an innovation culture ... Since *the company only had a future and nothing to defend*, it was very hungry for innovations. The team culture also benefited from the interest and commitment of senior managers'.⁵⁶

By 1988, Clearblue was generating annual trading profits of £8 million. The brand was launched elsewhere in Europe, and its success was followed by the development of a range of OTC kits. A determination to build on the original success was pursued through 'lock away' days in which small numbers of Unipath and Colworth staff brainstormed innovation ideas. These sessions were the origins of Clearblue One Step, the first pregnancy test kit to use PMA technology, which incorporated a porous nitrocellulose membrane built into a 'one-pot' system, thus eradicating the 'wash and wait' stages of previous kits. Launched in 1988, the technology of Clearblue One Step involved a dipstick impregnated with the relevant MCA and a colour-creating enzyme to detect the presence of HCG in urine. The One Step test incorporated a control feature giving added reassurance: two blue lines being positive for pregnancy, one blue line indicating a negative result. It was also more sensitive – it could detect pregnancy 'on the first day of the missed period', it was faster (giving a result in three minutes) and, with no wash stages, was far easier to use. The simplicity, speed, accuracy and reliability was conveyed in the advertising slogan 'No Bother. No Waiting. No Doubt'. Clearblue One Step rapidly gained 50 per cent of the British market and became a world leader following its introduction in Europe and the United States. Again, marketing played a key role in creating the desired brand image. The advertising strategy featured a woman alone consulting the test result in a bathroom shot through a soft focus lens. The image conveyed a message of privacy and control, and perhaps suggested in a more abstract sense, the reassurance that comes from 'knowing'.

PMA and the dipstick system provided the basis for several other OTC test kits, including Clearplan, launched in 1989, which tested for Luteinizing Hormone (LH) and was indicative of the onset of ovulation. In the 1990s, other kits included Clearview for Chlamydia, and Persona, a fertility monitoring kit launched in 1996. Persona, essentially a hand-held computerised LED monitor,

predicted ovulation based on changes in the concentration of LH and oestrone-3-glucuronide hormone in a woman's early morning urine. Knowledge as to when ovulation was taking place could increase/decrease the likelihood of conception following intercourse. All Unipath fertility-related kits featured the brand signature 'Fan Device', while generally packaging for the entire range was predominantly white so as to create a subtle and discreetly reassuring ambience about the products.

OTC fertility kits carried far-reaching social implications, not least in reconfiguring the dynamics of medical authority by restoring to women the possibility to exercise a greater degree of power and control over their bodies and over reproduction. Clearview's accuracy was vital in getting the support of the health care professions for such self-testing/OTC kits, and its contribution in this regard was very substantial.⁵⁷

VI

Unilever was a large corporation which, like many in the post-war decades, grew increasingly concerned over the disparity between its heavy expenditure on research and the disappointingly low level of new business creation in the form of marketable new products. The creation within such companies of small, organisationally discrete and culturally distinctive units offered, potentially, one means of resolving what remains a deeply troubling and widespread problem across the industrial spectrum. MPG and Unipath represented one variant of this strategy. They were conceived of not as general internal venture units, but specifically to commercialise Unilever's scientific leadership in immunology by building a new business in medical diagnostics.

From one perspective, the achievements of Unipath do not challenge the central role of large corporations in innovation. By 1980, Unilever had built up substantial expertise in immunology and lay in the vanguard of antibody-based technologies. The commercialisation of a home pregnancy test drew on Unilever-wide capabilities in innovation, branding and packaging. Unilever bankrolled the project, and financially supported it for several years. This benign support from a cash-rich corporation was critical in the early stages. While in the United States a stand-alone entrepreneurial company might well have been able to draw on venture capital funds and the wide investor interest in life sciences in the early 1980s to assemble the package of resources needed to develop such a product – and might well subsequently have been better able to develop further products – in Europe the sponsorship of Unilever may have been the only way Clearblue could have been developed.

The creation of Unipath and the development of Clearblue were initially dependent on the commitment of 'champions' at board level in Unilever. In a finding consistent with the existing literature, champions played a pivotal role in the Clearblue story: they were crucial in driving what was undoubtedly a groundbreaking, high-risk venture. Powerfully placed within

Unilever, they were able to provide the resources necessary to create a new business and, significantly, protected the venture in its loss-making early stage. Equally important was the commitment and managerial skills of scientists who played crucial roles in developing a tightly focused research programme in which great emphasis was placed on translating scientific and technological capabilities into marketable products.

As important was the creation of an organisation separate from the mainstream organisation. This energised and mobilised Unilever's capabilities, enabling them to be focused in delivering a commercial product in a new market. Unipath developed a distinctive business and innovation environment. The new company was innovation-driven and science-led and pursued a proactive, risk-accepting approach to product and market development – a culture central to its success. This was vividly illustrated by the different response to setbacks in research within the Unipath and wider Unilever environments. At Unipath a research programme on fertility monitoring – 'Project Frog' – in the early 1980s was abandoned.⁵⁸ In contrast to the response to the failure of Project Hyacinth within Unilever in 1980, the setback with Project Frog was viewed as disappointing but not catastrophic. Certainly it did not attract overly negative commentary, or a review of research *per se*, but was viewed rather as 'coming with the territory' of a company characterised by an entrepreneurial spirit amid the prevalent culture of 'risk acceptance'.

This, together with Unipath's flatter, goal-oriented and closely knit team culture, provided an environment conducive to new business creation. The open channels of communication between marketing and research was especially important. The extent to which this was felt to be effective at Unipath is evident in the words of one former team member that 'the transfer of technology from research to the market was the research team itself'. The 'bucket' system was conceived of and designed in response to consumer opinion – a development rendered possible firstly by innovative consumer research, and secondly by the flow of information between marketing and research. Unipath's size and flat hierarchical structure not only shortened communication lines, but also allowed all team members to participate in the innovation process – something that was strongly encouraged by management. Elsewhere, evaluation and review procedures fostered cohesion between all parts of the company and contributed to a 'team' ethos. All in all, Unipath evidently developed many of the characteristics such as a risk-accepting cultures, cross-functional teams, and other characteristics which appear good project leadership, along with the support of senior management champions, which the literature stresses as likely to stimulate successful innovation.⁵⁹

Yet if the differences between Unipath and its parent were crucial to its success, they were also problematic: Unipath engendered a sense of 'otherness', of being developed within Unilever but not of Unilever. Some sense of this dynamic is afforded by the reflections of the author of the in-house history: 'UNIPATH was often seen as a part of Unilever that did not fit the norm, and, as

such, UNIPATH has been a challenge to the organization. ... The impact of the team outside UNIPATH has been limited'.⁶⁰ Technologically, culturally and organisationally, Unipath was distinctive from its parent company. Despite Unipath's remarkable success, and although by 1990 the medical products business was profitable, it nonetheless remained, within the wider context of Unilever, a small, product category with sales amounting to only 0.3 per cent of Unilever's total. This, together with Unipath's decidedly 'non-Unileverised' philosophy and culture, was a source of growing tension from the later 1980s. This period saw a shift within Unilever's overall corporate strategy as the company sought to improve its performance by focusing on its core foods and home and personal care businesses. Within this climate, medical diagnostics looked increasingly out of place. Pressure mounted for the 'Unileverisation' of Unipath, evidenced, for example, in the requirement for Unipath to make greater use of the Colworth research facilities. At the same time, the company was also required to adjust its strategies towards the more conventional Unilever model of mass marketing. This shift in marketing positioning and product philosophy was strongly in evidence in the launch of the Persona fertility monitoring kit in 1996. Persona was retailed at £50 and aimed towards high volume sales. This strategy ran counter to that preferred by many within Unipath who saw Persona as a more expensive niche product.⁶¹

The view that Unipath lay outside Unilever's core interest assumed heightened prominence and its position within Unilever gradually appeared increasingly tenuous. The business was attractive to other medical product firms, however, including the US-based Inverness Medical Innovations, which approached Unilever on more than one occasion from the late 1980s onwards. In 2001, Unilever sold Unipath to Inverness for £103 million.

This article has provided further evidence about the complex issues surrounding new business creation within a large corporation. Large corporations may be engines of innovation, but enormous research and financial capabilities are no guarantee of the creation of dynamic capabilities in innovation or of successful outcomes. The vast range of organisational, political and cultural issues that are endemic within such environments make for very particular – and often entrenched – difficulties. This generates enduring tensions that underpin the central paradox between the vast potential of large corporations for innovation and new business creation, and their underperformance in these areas, caused by inertia, lock-ins and rigidities.

The establishment of internal venture units represents one potentially viable corporate strategy for new business creation, exemplified in the case of Unipath. Unipath was able to mobilise and leverage Unilever's existing and wide-ranging resources – for example, in research and development, and marketing – that gave rise to a new and successful commercial product. While this case study confirms – in this instance – the importance of product champions, cross-functional development teams, a risk-accepting culture and effective communications across the research/marketing interface for successful innovation, it is clear that

other factors were also in play. Market conditions were favourable, and Unipath's entry into the OTC market was sufficiently early to enable the company to rapidly secure leadership which, significantly, in the longer term proved unassailable. It was this particular confluence of circumstances that proved conducive to successful innovation. Nevertheless, the Clearblue case supports a view that large corporations can enhance their level of innovation by creating internal entrepreneurs or venture units.

However, the Clearblue case also confirms the argument that in the longer term separate internal venture units encounter political problems, or else their growth is constrained, because they are so organisationally and culturally distinct from the parent organisation. This orphaning, in the longer term, proved decisive to Unipath's future within Unilever. Rather, the effectiveness of such ventures seems to be greatest in the short to medium term, where the trajectory is influenced by numerous factors that vary with time and place. Recent literature has suggested that companies seeking to encourage dynamic innovation streams need to develop 'ambidextrous' organisational forms which contain multiple integrated architectures, inconsistent with each other, but linked strategically through the senior management.⁶² Unilever's prolonged search for the best organisational design to facilitate innovation streams – of which Unipath, and its development of Clearblue, represents but one example – demonstrates just how difficult and complex this process has proved for large corporations.

NOTES

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