ON THE MANAGEMENT OF INNOVATION IN SUGAR TECHNOLOGY:

A Personal Tribute to Tate & Lyle’s Ventures into R&D

Dr. Mike Bennett
(former Group Technical Director, Tate & Lyle PLC)
mikec.bennett@virgin.net

SUMMARY

With the disposal of its last refining companies, Tate & Lyle ended 150 years of sugar tradition: this article records some of the stages in the establishment of Tate & Lyle’s professional research and development facilities which took the Company to the acme of achievement and respect. It does not attempt to document what was done, but rather how it was done, and focuses attention primarily on innovation in sugar processing technology. From the pre-war days when there was little communication between operating units, one or two Directors of the Company were able to persuade their colleagues that technological innovation was vital to corporate health. Over the next 50 years, bold management decisions were taken that were to prove way ahead of their time. At many stages of the venture, the Company found itself in, what for it, were unfamiliar business activities, each of which required innovative management decisions.

Successful innovation in sugar processing technology probably led to over optimistic expectations for R&D in fields outside the then core business activities, and yet some of those research projects might be viewed as a portent of what has actually happened – the change from a bulk low margin product (refined sugar) to lower volume, higher margin food additives and ingredients. This article is a tribute to Tate & Lyle’s contributions and is illustrated by some personal experiences of the author, who between 1959 & 1989, was involved in some of the innovative ventures.

INTRODUCTION

In September 2010, Tate & Lyle PLC disposed of its last remaining sugar manufacturing plants in the UK and Portugal, thereby consigning to the past an international icon of the industry. The history of the company is well documented and few would disagree that during the last 50 years of its existence, Tate & Lyle rose in world esteem to be a leader, especially in the field of the technology of sugar refining. This was the original business of its component companies which merged in 1921, when the Lyle family business was making twice the profit on half the melt of the Tate family business. This paper records some of the bold steps which were taken to set up and develop the resources and facilities necessary to create, manage and exploit technical innovation. To take those steps, decisions had to be to be made at the highest level of the Board, and it was there that the wisdom and foresight one or two Directors must have prevailed over the views of sceptics.

THE ORIGINS OF R&D

Although it is reported that, in 1910, the first ever “research chemist” was appointed at the Lyle Plaistow Wharf Refinery, it was not until 1937 that, under pressure from H.C.Siegfried de Whalley, a separate building (Ardesco) on that site was converted to a Research Laboratory where many chemical innovations were created. As Tony Hugill describes “Some of these were ahead of their time, some were scrapped and some unsuccessful because they had not been sufficiently developed before being handled by process technicians and engineers. Anything introduced into the Process had to be 100% workable or someone would inevitably blow it up, burn it down or convert it to some use other than that intended.” Apart from one paper on the refractometer and a few contributions to ICUMSA, no work was ever published, and few records remain of what was done.

From a situation in the pre-war years, originating perhaps from the preciousely guarded secrets of how to make Tate Cubes and Lyle’s Golden Syrup, when there was virtually no technical communication between the three main UK refineries (Thames, Plaistow Wharf and Liverpool), let alone with other sugar refining companies, it took the impact of war to change the parochial attitudes. While process improvements were an on-going feature at all refineries, as the war drew to a close, the importance of technological innovation based on
scientific investigation was beginning to be understood by the Board of Directors, and it was recognised that a piecemeal approach to research was no longer appropriate. In 1943 Philip Lyle set up the first Research Committee, and the policy of secrecy was relaxed. The first edition of Oliver Lyle’s textbook “Technology for Sugar Refinery Workers” had been already been published in 1941, to be followed in 1947 by the first edition of his second textbook, “The Efficient Use of Steam”. By 1950 Frank Chapman had become a roving ambassador for the Company, bringing back the latest news of North American innovations.

T.L. RECORDS

It would appear that one of the first management decisions made by the new Research Committee concerned the documentation of technical records. A confidential in-house journal called T.L. RECORDS was created and the first issue in August 1944 contained a quite remarkable Foreword in which the rules were spelt out. It was anonymous, but probably the work of Philip Lyle, the Editor, and it introduced the subject with reference to the growing amount of technical paperwork now being circulated between the refineries and other departments. It stated that the present documents were “unsatisfactory as a permanent and concise record of work done”.

It was decided that while interim reports of sectional interest would still be dealt with as before, “papers dealing with subjects of general interest and the results of research, experiment or study which merit more permanent record, should be brought together from time to time in printed form and issued as and when sufficient papers are forthcoming”. It was hoped that such records would not only prove useful for the purposes indicated, but would “be of value to young members of the firm who hope some day to occupy positions of authority”. The Foreword continued “papers submitted for inclusion in these records should not necessarily follow any stereotyped lay-out, yet attention may perhaps be drawn to a few points which experience has shown to result in satisfaction to the average reader as follows”.

(i) **Summary.** A paper should start with a Summary giving clearly the subject dealt with or the object of the investigation and the main results and conclusions for the following reasons. (a) Some readers may not be sufficiently interested in the particular subject dealt with to wish to wade through a mass of figures to find the results, but may wish to see the results set out clearly without the detail. (b) In later years it may well be that a reader will look up papers which have appeared in some old number and wish to see at once the results obtained without having to read the whole paper.

“The paper itself should include everything and not omit anything already stated in the Summary, a result which is satisfactorily achieved by writing the Summary only after the paper itself has been completed.

(ii) **Sections.** If the main paper is divided into several numbered sections each with a heading it not only helps a future reader looking up the paper in a back number to trace quickly the information he wants, but helps the writer of the paper to pass in a logical sequence from one part of his argument or story to the next.

(iii) **Drawings.** All drawings or figures should be made in black on white paper or tracing cloth and twice the size that they are to appear in print, to allow for photographic reduction by the printer, and this of course applies to the size of any letters or figures given on the diagram.

(iv) **Accuracy.** Where possible when any numerical figures are given, the lack of their degree of accuracy should be stated, e.g. if metered steam consumption figures are given and the meter is known to be accurate only to within +/- 4%, this should be stated.

(v) **Language.** It should always be borne in mind that a paper may be read in 20 years’ time and that one must avoid using current jargon or undefined abbreviations which all understand today but which may be ambiguous to the next generation.

(vi) **Intelligibility.** Writers are recommended to get colleagues, particularly ones who are not experts in the branch being dealt with, to read and criticize their scripts.
That such editorial detail should be specified by a senior Director of the Company is an indication of the seriousness with which Tate & Lyle was viewing the potential of R&D, and the need for proper accurate documentation. But Philip Lyle went even further: in the two issues of T.L.Records in 1945 he included a paper in three parts entitled “The Design and Analysis of Experiments”, a very clear attempt to bring scientific method into the planning of a research programme. In fact, T.L Records continued to be published from time to time until No. XII, Dec 1963 and did contain papers on subjects well outside any technological sphere, for example “The Treatment of Export Sugar Costs”, “Product Costs and Profits”, “Sugar and the Human Body”, “The Electric Sugar Refining Company Swindle”, “The Good Foreman” and even “A Letter From A Barbadian Bricklayer”!

In the 1961 issue, the author of this paper contributed an article entitled “The Chemistry of Bone Char and other Carbonaceous Adsorbents”, which included a review of the work of the Bone Char Research Project based in Washington DC under the Direction of Dr. Vic Deitz, a project sponsored by many international sugar refining companies including T&L. That review was one of the many pieces of a jigsaw which when put together, led eventually to the discovery of colour precipitation and the “Talofloc” Process.

RAVENSBOURNE

After war, improvements in process technology were growing apace, especially at the Lyle Plaistow Wharf refinery where the objective was unashamedly “excellence”. Attention was turning towards the matter of personnel, and in particular, to the professional staff that would be necessary to carry out the work which the Research Committee had in mind. Siegfried de Whalley had already begun to recruit technologists qualified in chemical engineering, physics, chemistry, and microbiology, and it was only a matter of time before it became apparent that the Plaistow Wharf site at Ardesco provided neither the right atmosphere nor the environment for the research work, which was rapidly moving “up-market”. There was also the added complication of a clash of personalities arising partly through the Lyle family dominance of research effort at Plaistow Wharf, while other individual efforts at Thames and Liverpool (the old Tate) refineries were seemingly being overlooked. This problem was nipped in the bud in 1947 when the Board of Directors decided that the Company should have a separate Research Centre, away from any of the refineries, and agreed to the purchase of a beautiful country house called “Ravensbourne” at Keston, Kent. This was followed shortly afterwards by the purchase of “Forest Lodge”, next door, and both were converted to laboratories complete with an excellent library and dining facilities: it may not be pure coincidence that at the same time, British Sugar Co. Ltd was purchasing “The Grange” at Bramcote, Nottingham, where Dr. “Ace” Carruthers was to set up BSC’s research laboratory. While the new Tate & Lyle Research Centre, under the management of de Whalley, was to become the company’s technological think-tank for the next 20 years, process innovation and development activity continued to grow at the refinery sites and a separate Development Committee was set up to coordinate the programme of work.

Siegfried de Whalley died in 1957, and was succeeded at Ravensbourne by Bill North from Thames Refinery. Bill was one of the original members of the first Research Committee, and since Philip Lyle had died in 1955, there was now a significant change in the composition of that Committee. Saxon Tate and Colin Lyle were the two senior Directors responsible for Research, and a new pattern of research management began to appear.

The Board’s policy was, quite simply, that only problems as bear directly on sugar refining would be studied. The immediate consequence of this was that the recruitment of research staff became very much more selective. Research scientists specialized in certain specific areas of chemistry and physics were sought with the objective of finding some who were capable of spearheading the projects. The author of this paper was one of those recruited in 1959, the specialism in this case being surface chemistry which had been acquired at Prof. Sir Eric Rideal’s department at King’s College, London, and the experience coming from 6 years of research on raw cane juice clarification in the Sugar Research Scheme at Imperial College of Tropical Agriculture in Trinidad. Ken Parker was another highly qualified Oxford chemist recruited at that time, his specialism being the organic chemistry of colorants in raw sugar which he had studied for 3 years, also at ICTA in Trinidad. Even here, the Chairman of the Board’s Executive Committee, J. O. Whitmee, himself a science graduate, conducted the interviews, together with Colin Lyle.
In spite of the experience that such recruits would bring to the T&L research effort, they encountered another remarkable piece of management philosophy: they were not to be allowed anywhere near the research laboratories until they had learned how to manage a sugar refinery. In your Author’s case, he spent one year at Thames refinery, at the end of which for two weeks he filled the position of Shift Manager, followed by 3 months at PLAISTOW Wharf Refinery, ending with 2 weeks as Shift Manager, followed by a further one month at Liverpool Refinery ending with one week on shift. The effect of such an introduction to the Company’s research requirements was dramatic but, above all, it provided the best possible guarantee that “pie-in-the-sky” research ideas would be kept away from the refineries until the chances of success were reasonable. While the Tate and Lyle management of innovation was again proving itself to be way ahead of its time, some curious administrative procedures (probably from Thames Refinery) were introduced: for example, all senior scientists had to undergo IQ testing!

It was also in the 1950’s that Tate & Lyle was expanding rapidly in the West Indies and the Board was becoming increasingly aware that profitability was being affected by a range of serious technical problems in the agriculture of sugar cane. Separate research teams existed at Frome and Monymusk in Jamaica and at Caroni in Trinidad but a major decision was taken to centralise the research effort at a new Tate & Lyle Central Agricultural Research Station in Trinidad, which became operational in 1958 under Dr. Chuck Vlitos. 10 years later, Chuck was to succeed Bill North at Ravensbourne and lead the Company’s research programme into completely new fields.

PUBLICATIONS & PATENTS

Throughout the 1960’s, with an increasing number of professional research staff generating an increasing amount of scientific data both in the UK and the West Indies, the question of publication was the next issue to be addressed by the Board in London. The days of secrecy had passed and the personal ambitions of young scientists were recognised. Even the then Chairman, Sir Ian Lyle, remarked that, “in the old days, we were prepared to tell anyone what we had done, to tell anyone most of what we are doing, but tell no one what we are thinking of doing”. But the publication of scientific and technical data would not necessarily impact commercial considerations, and so, with a vetting procedure established, publication in appropriate national and international journals was permitted, and eventually encouraged. It was the dawning of yet another age in the way TL managed the technological innovation it was creating.

There were two major consequences of this final change from secrecy to publicity. Firstly, the authors of those papers were invited to attend international Conferences to present their work in person, which led of course to membership of Technical Societies, and in many cases to their eventual election as an officer of those Societies. Some 10 years later, the foundation of The British Society of Sugar (Cane) Technologists was largely due to a Tate & Lyle initiative in which the first meeting and first election was held at the Tate & Lyle Research Centre at Reading University. What had been established was a communication route whereby the Company became much more aware of what was happening around the world, not only in the research laboratory but in the fields and factories and refineries of all the other sugar companies. The second major consequence was the need to protect the Company’s commercial interest no matter how remote the scientific publication might appear to be, at that time, from any commercial application. In 1950, Tate & Lyle had no process technology patents: with a policy of secrecy, if they were thought about at all, they may have been viewed as unnecessary.

But in the 1960’s, with research and technical staff participating in exchanges of information, the need for Patent protection became a matter of urgency. The trouble here was that the Company did not have the expertise, making it essential to solicit the services of qualified Patent Agents. Here the Company took another bold step in its management policies: the scientists themselves should learn about Patents and Patent Law before talking to the Patent Agent. A number of T&L staff were therefore sent to attend specialist courses so that they could at least “speak the same language” as the professional being paid to write the Specification.

The company was going to incur considerable costs and several discussions were held to ensure that the expense could be justified. To clarify the issue, an analogy was drawn between a new scientific discovery, now termed “intellectual property”, and a newly acquired piece of land: before building a fence to define the
boundaries of the land, or property, one had better decide what one intends to do with it. For stock-farming, a post and wire fence might be adequate, for a garden, a hedgerow, but for a nudist colony, a 3 metre high close-boarded fence would be more appropriate. The need to identify possible commercial exploitation routes was of course well known in, for example, the chemical, pharmaceutical and electronics industries, but not to Tate and Lyle, which was new to patents and certainly new to their commercial value: this was an area which had not featured on the Agenda of the Research Committee. Here the Company was creating new technology for the growing and manufacturing sugar, but what should be done with proven, economically sound technology which, for very good reasons, could not be used in the Company’s own major operating units?

COMMERCIAL EXPLOITATION

The Company already had a vehicle, T & L Technical Services (TLTS), for providing expert advice to non-Group companies, including some that might be deemed to be competitors. TLTS had already used the very latest Ravensbourne technology, which had proved so successful at Liverpool Refinery\(^1\), in the design of a carbonation plant for Amstar’s Chalmette Refinery in New Orleans. It was decided that patented technology could be offered under licence, even to competitors, and this important decision was to have a vital bearing on the design of the Patent Applications. The difficulties of policing licensed technology were already appreciated, and this led to consideration of additional means of protecting T&L’s intellectual property. Attention was focused on the specialty chemicals needed in the processes, and in those cases where there were only a very few manufacturers world-wide, a very simple and well-publicised commercial arrangement was made with them to ensure that only bona fide Licencees would be supplied by them with products meeting Tate & Lyle specifications, and sold under Tate & Lyle Trade Marks. The Company had now entered the chemical trade, and, once again, the development of its new technology was taking the Company into yet more “uncharted waters”– Trade Marks and the food additive Regulatory Authorities, such as the US Food and Drug Administration.

The interest and support from the Board continued to grow: on a personal note, the author of this article, having just set up a new unit called “TALO Products and Processes”, was summoned to appear before the President, Sir Ian Lyle, to be quizzed about the commercial implications. Eventually, the President asked “what do you need from us?” The one-word answer he was given was “independence”, to which he responded “I like your Business Plan, come back in a year and tell me what really happened”! As various accounts have shown\(^1\), the Business Plan was successful, and during the next decade a whole range of processing and agricultural chemicals were to become available under “TALO” Trade Marks. In later years, many more products and Trade Marks were to follow for markets completely outside sugar manufacture.

In 1966 Bill North retired and Dr. Vlitos came over from Trinidad to become Director of Research at the Ravensbourne Research Centre. In the Preface to his introductory publication\(^1\) “This is Ravensbourne”, the two main Board Directors responsible for Research, Colin Lyle and Tony Hugill, spelt out new Corporate objectives: “to be of value to the industry, to produce exploitable results and to produce results at the right time. This does not mean that the Centre should concentrate simply on bread and butter work. Some of its effort must go into long term fundamental research”. Chuck Vlitos himself states\(^1\) “fundamental studies on growth, enzymology, photosynthesis, translocation of sugars and storage of carbohydrates in plants are therefore bound to become crucial topics for future research”. But he continues “we could profit a great deal if we could take advantage of the versatility of the sucrose molecule to produce new products”. This had been the major theme of programmes undertaken in the past by the Sugar Research Foundation of New York under Henry B. Haas, and by the Sugar Research Scheme at The Imperial College of Tropical Agriculture in Trinidad under Prof. Leslie Wiggins. Neither of these organisations achieved their primary objective, but nevertheless, Tate & Lyle embarked on such a programme and did achieve one notable success.

As a breath of fresh air blew through Ravensbourne\(^1\), new procedures relating to confidentiality and security were introduced; for example, each night, all raw data notebooks and records were dated, signed and locked away in a safe. The first Annual Report from the Research Centre was issued in 1967 and contains many references to products other than sugar and cane: for example microbial protein, carob bean, yeasts, ethanol all feature as new projects. Furthermore, confidential sponsored work in external academic research laboratories was introduced, and this particular strategy was, later on, to provide the success referred to above.
- sucralose, the thermostable, non-calorific intense sweetener based on the sucrose molecule, sold world-wide today under the Trade Mark “Splenda”. Sucralose was actually discovered during a programme of collaborative research on carbohydrate chemistry, supported by Tate & Lyle at Queen Elizabeth College, London University. Quite deliberately, that first 1967 Annual Report made no mention whatsoever of colour precipitation or of the massive development programme which was already underway to create the (Talofloc) process in which it could be applied – the patents were not yet granted, the specialty chemical additives not yet approved for food manufacture, and there were no working plants from which operating data and true costings could be obtained. All of this was to take another 4 years, and the “launch” was eventually planned for 1971 when the annual SIT Meeting was scheduled to be held in New York in May, and the (4-yearly) ISSCT Meeting was scheduled for October in New Orleans. Two quite different papers were prepared for the Meetings, and although the order in which they were presented should probably have been reversed, the response was remarkable and far in excess of any Business Plan expectations. The new technology had created a new business activity, and by 1973 there were 76 Licensees in 21 countries. In 1979, the “TALO” business unit was to win The Queen’s Award to Industry for Technological Innovation: the unit was only a minute part of the Tate & Lyle Company, yet the award ceremony was attended by both the then Chairman, Lord Jellicoe and the Group MD, Saxon Tate, another illustration of the interest, support and excitement which this innovation was engendering on the Board.

THE RISE AND FALL OF R & D

By 1970, it appeared that the Company’s appetite for Research had been whetted: the research programme was growing so rapidly that the management of its development activities was now receiving special and separate attention, with Colin Rowan, the Director responsible. The TL Annual Research Report became the TL Annual R & D Report and, furthermore, the construction of a completely new laboratory building was sanctioned on the campus at Reading University. In 1972, in the Preface to the first R&D Report from the newly-named Philip Lyle Memorial Research Laboratory, Rowan and Hugill state “This is probably the first example in the UK of an industrial research centre becoming, as it were, a part of a University and yet completely autonomous….”. This bold move by the Company won a great deal of public acclaim and, without doubt, added to the prestige of Tate & Lyle Ltd. The total staff numbered over 60, together with some 30 students, and during the year some 44 publications, patents and lectures were recorded.

Around this time, another important change was taking place in the Company’s attitude to R&D personnel. From the days 30 years previously when it was thought that refinery staff did not necessarily make good research scientists, there was now a dawning realisation that some research scientists might actually be able to do something other than scientific research: they might, in fact, make good company managers. On a personal note, your author was approached by Colin Lyle and Johnny Tate late one evening and asked “Do you want to wear a white coat for the rest of your working life?” The response of “no, why?” led to a gruelling 16 weeks at The Administrative Staff College (known today as The Henley Business School) and eventually to a complete change of career path, not always without a touch of devilment. For example, some 5 years later, to ensure the continuing availability of bone charcoal for the Company’s UK refineries, Tate & Lyle had acquired British Charcoals and Macdonalds Ltd in Greenock. But this was at the time that the TALOFLOC process was gaining an appreciable share of the world refinery market, and was being viewed as a major competitor of bone charcoal. What better than to have the same person manage both units and let him sort out the problem: in 1975, your author duly took the Chair of BCM Ltd., a post he filled for 12 years.

Many other members of the Research Staff underwent career changes within the TL Group and became, for example, MD’s of subsidiary companies or the General Manager of a factory or refinery. There can be little doubt that this cross fertilisation of professional experience did make an important contribution to the rapid growth of Tate & Lyle over this period.

By 1980, R&D staff numbers had risen to 160, plus another 100 at Talres Developments Ltd., a company set up with a substantial manufacturing facility at Knowsley, Merseyside to develop commercially a new family of sucrochemicals and other new specialty products: in addition, Biospecialities was another facility established at Reading to develop yet another family of products. On top of all this, synthetic sweeteners, which had featured in the research program for many years, and, in particular, the sucralose project were
requiring an ever increasing investment of resources: and Group R&D was continuing to provide a great deal of invaluable back-up to any operating profit centre in the TL Group which asked for such help. This certainly included the support to the newly formed Tate & Lyle Process Technology Ltd, and to the Technical Products Group of which it was a part. As an example, as a result of this support, British Charcoals was able to launch two new products: immobilised enzymes for the corn syrup industry and hydroxyapatite for prosthetics. The 1980 R & D Report records that 49 papers were published, 13 Patent Applications were made and 4 Patents published: this was probably the finest hour for the Tate & Lyle research effort.

Regrettably, the 1980’s were to see the end of centralised Group R&D activities. There are no recorded reasons as to why, over a period of less than a decade, the Board completely changed its mind about R&D, but even by the end of 1980, change was already in the air. With Lord Jellicoe in the Chair, the Company was just emerging from a very precarious corporate situation, about which Chalmin commented “There was widespread uncertainty concerning: the European Sugar arrangement……., the future of the HFCS market, the future of sucrochemistry, the future of agribusiness … outside the sugar field, and about the firm itself”. To these concerns should be added: the escalating R&D Budget, the lack of progress in bringing sucrulose to the market, and, indeed, the lack of success in finding another potential “winner”.

In 1981 Neil Shaw took over as Group MD and more changes followed. The “writing was on the wall” for Group R&D when Chuck (now Prof.) Vlitos left in 1983, the same year that Lord Jellicoe retired. By this time, there were no members of the Tate or Lyle families in an executive role on the Board, and under Bob Haslam, it seemed that the Board was losing confidence in R&D as a means of Corporate expansion. With no technologist, let alone scientist, on the Board, they must have found it extraordinarily difficult to comprehend the significance and true possibilities of such a broad R&D programme as that which Renton Righelato, the new and last Head of Group R&D, had inherited. The Knowsley development facilities were sold off, and in 1989, with Sir Neil Shaw now both Chairman and CEO, The Philip Lyle Memorial Research Laboratory was closed and passed over to Reading University.

CONCLUSIONS

There can be no doubt that, during World War 2, one or two members of the Board recognised the contribution that science-based technology was making in certain areas to the war effort, and that benefits in efficiency and cost savings might be available to Tate & Lyle sugar refineries through research. But the company was parochial, scientifically unadventurous, and not equipped with either staff or facilities to carry out the necessary investigations. Fortunately, at the Lyle Plaistow Wharf refinery, one man, Siegfried de Whalley, was willing to take up the challenge set by Philip Lyle and create an embryonic research laboratory.

Tate and Lyle did not depend on technical innovation and it did not know how to do research work nor even how to record data for future use. But initial results were interesting and stimulating, and led to the introduction of professionalism, and later on, scientific specialism. R&D grew and significant innovations began to interest the Board, particularly as each step took the Company into the hitherto unknown fields of Patents, Trade Marks and Food Additive Regulations. But the original successes were almost entirely in the field of sugar processing technology, which was “bread and butter” and therefore understandable to the Tate & Lyle families which dominated the Board. Whether or not those early successes clouded its judgement, the Company embarked on a truly massive expansion of its R & D facilities, which by the 1980’s were the envy of the sugar world. As Philippe Chalmin had stated at that time “Tate & Lyle is the most advanced firm in sugar science. And that is where the power lies, not in the ownership of sugar factories or refineries”.

Not everyone would agree with his second sentence, but that was when the Tate family and Lyle family members were leaving the Company, which prompted Chalmin to comment prophetically in 1990 “The end of Tate and Lyle (as) a family firm was also, in the medium term, the end of sugar refining in Great Britain and perhaps even the end of Tate & Lyle’s (corporate) sugar strategy”. Group R&D activities had ceased, and 20 years later, Tate & Lyle had ceased making sugar, leaving, in the main, only the sugar process technology for a new owner, and sucrulose for the new Tate & Lyle. The management of innovation through R&D had changed from “Group” to “Divisional”, more generally referred to today as “decentralisation”
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