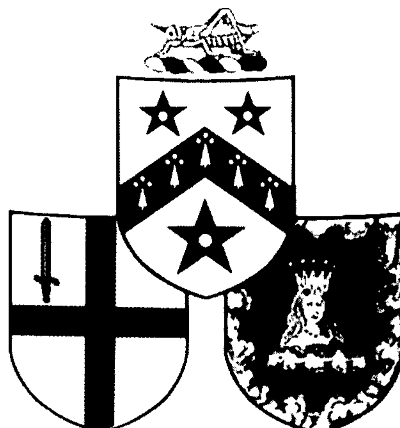
GRESHAM

COLLEGE



Reproduction of this text, or any extract from it, must credit Gresham College

CAN THE CITY ADAPT?

Lecture 3

WILL THE CLEARING HOUSES OVERTAKE EXCHANGES IN ECONOMIC IMPORTANCE?

by

PROFESSOR DANIEL HODSON MA
Mercers' School Memorial Professor of Commerce

7 December 1999

WILL CLEARING HOUSES OVERTAKE EXCHANGES IN ECONOMIC IMPORTANCE?

Professor Daniel Hodson

In preparing for this lecture, I was reminded of those classic words of instruction in The Importance of Being Earnest from the redoubtable governess Miss Prism to little Cecily, the country ingenue: 'The chapter on the Fall of the Rupee you may omit. It is somewhat too sensational. Even these metallic problems have their melodramatic side' To many, even well informed, observers clearing is an obscure and Byzantine science, of as little interest as the 19th century Fall of the Rupee, but it is gradually moving into central stage.

Towards the end of 1992, the London Clearing House (LCH from now on) reached what turned out to be the defining moment in its long history, dating back to 1888. Its then owners, six great clearing banks, announced privately that they had had enough, and they wished to be relieved of duties which they did not relish nor broadly understand. Nearly four years later, after a prolonged and often bitter debate over its constitution and ownership, LCH emerged as a reborn independent clearing house, its existing franchise intact and a world of new opportunities to be grasped beyond. It has never looked back.

My thesis tonight is that clearing, the assumption of credit or counter-party risk arising as a result of financial or commodity market transactions by a central institution has finally come of age, and that LCH, in cutting loose from the exchanges which gave it the breath of life, is probably embarked on the road to becoming one of the key financial institutions of Europe, if not of the globe – in contrast to the individual exchanges which it serves, who are doomed, as I have argued in my last lecture, to becoming purveyors of automated, commoditised and cheap services, and to lose their favourite son status in their cities of origin. Nor do I expect its experience to be unique, for I shall argue that its opportunity could be shared with a limited number of similar clearing houses, currently linked to one or more great exchanges.

In so doing I shall describe the process of clearing and place this in the context of the hard-won reconstitution of LCH. And I shall explain how the key importance of clearing of to exchanges has, ironically, created greater pressure for greater independence of clearing houses, as have the opportunities for clearing in the over-the-counter or OTC markets.

Clearing's origin is firmly based in the development of exchanges. Originally trading, as in ancient and modern street market places, was done on a bilateral basis, ie the buyer and seller agreed the bargain, and it was between them as to whether it was ultimately fulfilled. As city markets formalised, several things occurred. First it became clear that a universal description of the commodity being traded was essential. Wherever you stood in the market you wanted to know that you were buying or selling the same product, in the same quantity and quality, and where it might be delivered. In other words, contract specifications and lot sizes began to be drawn up, so that each bargain was for an identical item. In addition, as markets grew, increasing numbers of transactions took place each day, some even between people unknown to each other, and the concept of a central counter-party which in effect stood in the middle of each trade between buyer and seller and guaranteed the obligations of one to the other, was born. The high quality underwriting of performance provided by a clearing house became an important attraction to draw potential participants to exchange rather than bilateral trading. This was of course particularly true of derivative exchanges, where delivery under a contract might take place – theoretically at least – literally years after the original bargain was struck. The ability

of either side to perform might all too easily have become impaired by the passing of time, and market traders preferred to leave that calculation to a central guarantor.

As the system developed and grew more sophisticated, those who had direct access to the clearing house, who were in other words allowed to hold their positions there, were called 'members' of that clearing house or 'clearing members' of the relevant exchange. They had to be high quality credit risks for obvious reasons and were in effect the fulcrum of the whole risk management structure of the exchange. While the clearing house managed its exposure to them, their job was to manage a comparable back-to-back exposure to the other market participants, ie smaller intermediaries/brokers, professional traders and outside participants and users.

Today a clearing house not only guarantees performance under an exchange contract, in other words that the underlying commodity, physical or financial will be delivered as agreed, but also – in an electronic rather than an open outcry or floor traded product – the anonymity of the counter-party concerned. In an open outcry environment, where buyers and sellers are obviously transparent to market participants, this is clearly not possible, but it is an increasingly valued element of equity markets, where many market players like to operate by stealth for fear of the market reaction to knowledge that they are buying or selling a particular product; but where delivery is a minor risk, since it takes place within a very few days.

Undoubtedly a clearing house's unique skill is in risk management and specifically the management of default, where its objective is to ensure that first it does not lose money and second that the event causes the minimum of market disruption, preferably none. It is a rare event indeed for a delivery to fail or 'default', and in these unlikely circumstances the clearing house may well know in advance of the possibility, usually because of the insolvency of the position holder, or its failure to put up the required 'margin' or collateral for its position.

Margining is at the heart of successful clearing and is the process whereby a percentage of the value of the position concerned is held at the clearing house as security for that position. Methodologies vary, but generally there will be so-called initial margin paid when the position is established and variation margin subsequently paid when the value of the position reduces to compensate for that loss. Many if not most exchanges also pay an appropriate amount of variation margin back to position holders if the value of the position increases. The calculation of the margin varies, but it will be based on the potential maximum short term price variation or volatility of the underlying product, and ranges from a fraction of 1% to 20% or more for equity based contracts.

Thus in the event of an anticipated default or a failure to provide margin when demanded or an actual default on delivery, the clearing house acts quickly to close the relevant position or to acquire or sell the commodity delivered. Any money lost in this process is recouped in the first instance by margin held. That of course may not be enough. In these circumstances the clearing house will turn to other resources at its disposal.

In general its first is to a guarantee with substantial backing which is without recourse to the balance sheet of the clearing house itself. It is generally put up by the clearing members or the owners of the clearing house, if they are different from the clearing members and are substantial enough (as they were in the case of the six major clearing banks and LCH). If provided by clearing members, it is usually in the form of a fund to which clearing members subscribe as part of their obligations, or otherwise an undertaking to pay up certain circumstances occur. If a payment is made under the guarantee, the clearing house generally has no obligation to make it good to the payers, and there are usually provisions that if such a 'hole' is made in the guarantee it will be immediately replaced by the guarantee providers.

Such a guarantee is a specialised and little understood risk, a fact which in part led the great six clearing banks to withdraw their support for LCH. It is therefore more difficult to attract third party providers, although it is interesting that the insurance market has begun to look at this as a new business opportunity and LCH, in the course of its reconstruction actually raised a secondary tranche of guarantee, behind a clearing member guarantee fund, from the insurance market.

Almost all the major and well established clearing houses came into existence as a result of the activities of an exchange and usually a co-operative one, one which was owned and governed by its members, themselves the intermediaries and traders active on the exchange. The exchange could not function effectively without a clearing house and it was indeed at the centre of its obligations. A pattern was therefore established of clearing houses which were either subsidiaries of the exchange itself, or owned directly by its clearing members, who had a vested interest in its efficiency and risk management. Furthermore there were onerous obligations and contingencies associated with clearing, not least the need for a guarantee fund, and it was unusual to find parties willing to accept the risk associated with such an entity, so it had to be assumed by the market itself. The exchange did not generally have the resources, which meant that the burden fell on the broad backs of the clearing members.

This is however not the only model and there are very successful third party owned clearing houses, usually providing clearing for plc structured exchanges, such as Eurex or the Swedish exchange OM. But the unique common purpose of co-operative collaboration and self-protection still casts a spell over clearing. The tantalising question is whether clearing participants in global markets would, on balance, rather clear at a clearing house which they in part own and govern, or whether they are content to place their business wherever is convenient. This will, I believe, be a question of crucial interest in the development of world, and specifically European markets, and I will address it later.

In this context it is time to expand on the LCH saga of the early and mid 90s for it stemmed in large part from these issues. In the 1970s at the instigation of the Bank of England, the six great clearing banks in Britain, had taken over ownership and responsibility for the obligations of the ailing International Commodities Clearing House (ICCH), as LCH was then called, and had, probably more *pro bono publico* than anything else, supported it through a period of extraordinary expansion, principally on the back of its close relationship with the London International Financial Futures and Options Exchange (LIFFE), although three other important London exchanges cleared there at that time. LIFFE had opened in 1982 and after a slow start had enjoyed a meteoric rise. But the clearing of financial and derivative markets was always a specialised, arcane and non-core activity to these commercial banks and they became increasingly concerned, as the activity in LIFFE contracts grew in size and complexity, that they had a tiger by the tail, and one which they did not in truth properly understand. It was of particular concern that, as owners, they were considered 'good to the last drop' for all the obligations of LCH, and the Bank of England did not demur from that perception. Yet they were, even in aggregate, relatively small players in the LIFFE market.

So they took a decision to dispose of their interest, and put the Bank, LCH and the markets served by the latter – at that time, in order of volume, LIFFE, the London Metal Exchange (LME), the International Petroleum Exchange (IPE) and the London Commodity Exchange (LCE) – on notice that they wished to do so. In effect they passed the responsibility back to those exchanges and the markets and participants that they served. The markets were, they rightly felt, sufficiently well developed, rich and powerful to accept responsibility themselves for an activity which seemed to give the banks an unlimited risk and one that they did not properly understand.

The argument lasted nearly four years, with the clearing banks looking on, at first benignly – 'let the market determine its own future' – and then becoming increasingly incredulous and frustrated at the internecine warfare, particularly within the LIFFE community who were deeply divided on the issue.

Simply put, on one side of the split those, including the Chief Executive (me!), who felt that the Exchanges themselves, and LIFFE in particular should take over ownership of LCH, on the grounds that it was an integral part of their activities, a 'Siamese Twin', and indeed that control of the LCH was a central part of the strategy of LIFFE. I for one was totally convinced by the old management adage that if something was absolutely critical to your business, you needed to control it as closely as possible and think many times before you out-sourced to a third party, however well disposed the latter might be – for circumstances might change.

On the other side were those, members of the clearing house themselves in the main, who felt that clearing was a separate business from exchange trading, that it was an increasing part of derivative originated revenues and that it was essential that they, the clearing members, should have direct control, rather than having it diluted and one-off through an exchange. They were particularly concerned that their involvement in the governance of LIFFE was far from satisfactory because of the many other factions involved, such as professional floor traders or locals, and the smaller non-clearing broker and dealer participants in the market. The last thing they wanted was to cede control of LCH at a critical juncture to LIFFE and in any event what right had LIFFE to use its resources for such an adventure. Wouldn't they have to guarantee the obligations of LCH anyway?

It would take a Trollope novel of the vision and scope of 'The way we live now' to describe the secret and not-so-secret comings and goings and frustrations of those years, but suffice it to say that at first the tide appeared to swing in favour of an exchange controlled solution, but critical mass for the notion proved hard to achieve. In the event it was the collapse of the Barings bank in 1995 which shook the entire exchange world and which swung the argument firmly against that approach. Ironically, the insolvency and its subsequent ramifications underlined the importance and robustness of the clearing system associated with the major derivative exchanges of the world, for no client money was lost other than through trading, and no other major firms were brought down in the aftermath. But it also told participants that exchange trading was a risky business, that understanding and managing counter-party risk was a key part of it, and that if so-called clearing members (those who stood guarantor for the obligations of other market traders and users) were providing a guarantee to the clearing house, as it was likely that they would, they ought to control the clearing house themselves. It was now clear, if it wasn't before, that there were real exposures involved.

In addition the clearing banks also seized the moment by threatening that, if they were not relieved of the LCH burden they would significantly increase their charges. This above all convinced those in the exchange community – and there were many – that they weren't bluffing and really did want out.

So it was that a novel and imaginative restructuring of LCH emerged and was finally endorsed by all concerned in the summer of 1996. Control would rest with the global financial community in the form of clearing members who would also put up a guarantee fund to support the capital and obligations of LCH. The exchanges would have a minority interest stake distributed pro rata to their turnover, in order to protect their vital interests, and a seat each on the board. Their relationship with LCH from then on would however focus on the arms-length provision of clearing services, and they had no veto on LCH's strategy for the future. It was an absolutely critical moment in the history of London markets, for it proved to be the rebirth of an independent clearing house. It also occurred with immaculate timing for there were two strategic factors

developing which were tending to increase the tensions between clearing houses and their related exchanges and potentially to drive them apart. The cosy, symbiotic and stable relationship which had existed historically would become a thing of the past.

To understand the first it is necessary to understand exchanges increasing vision of clearing as a market opportunity.

The fundamental operational quality of a clearing house is always important, and effective systems with easy interfaces with members own activities are a bureaucratic necessity.

It is therefore necessary to ensure that the margin level is netted down where multi-product positions are held at the same clearing house. This is based, in simple terms on the assumption that the pricing behaviour of many more or less related products will move to a greater or lesser extent in sympathy. An obvious example is the price of an option on a future which will surely move in some predictable way with the future itself. Or a short term interest rate (or STIR) product denominated in a certain currency whose interests rate movements may have some relationship with a similar STIR product but in a different currency.

In fact the larger, more multi-product and more complex the positions held at a clearing house, the more attractive that clearing house becomes and by direct deduction the more attractive the exchange or exchanges are whose products are cleared there. In a word, a major part of an exchange's Unique Selling Proposition (or USP as marketeers say) will be the clearing house at which it clears its products. It is hardly surprising that, as a strategic matter, exchanges – having regard, of course, only to their own interests and not necessarily to the related financial community as a whole – would like to be in a position to control their clearing houses.

The irony of this is that the more exchanges that clear at a certain clearing house the more attractive will that clearing house be, and the more it will desire and perhaps need its independence from each of them. Thus a major attraction of LCH is the fact that three great London exchanges clear there – LIFFE, LME and IPE – as is the fact that they share many important common members so that the latter only have to hold positions and margin at one place. Similar motives have led to the continuous calling for the merger of the respective clearing houses of the (Chicago Mercantile Exchange (CME) and the Chicago Board of Trade (CBOT), which would on the one hand be a huge bonus for joint clearing members but would significantly lessen the grip of the respective exchanges on their related clearing house.

These tensions have led in part to a form of half-way house whereby quite sophisticated deals between clearing houses of respective exchanges ensure that margins at one can, wherever possible, be offset against margins at another. Such arrangements allow each exchange concerned to maintain its historic relationship with its clearing house and have been accomplished in the past between domestic US based clearing houses. Now LIFFE and the CME are in the last knockings of accomplishing a groundbreaking cross-border arrangement. The problem to be surmounted is the complex interrelationship between national insolvency laws and also the requirement for full co-operation for national regulators. Neither are easy to achieve and the margin offsets are still only limited to the business of the clearing member itself and not that of its clients. Nonetheless one could envision a perfectly feasible and sensible strategy for a clearing house to pursue a dual strategy; both to clear a number of exchanges directly and to establish a pattern of associated clearing houses where for instance margin offsets are available.

Such tensions are also clearly evident in the context of the OTC market, where direct competition could, and does to a degree exist between exchanges and clearing houses.

'Over the counter' conjures up some wonderful images of scruffy mum and dads stores, with goods, probably rather second rate, being furtively exchanged. In fact of course it is by far the largest part of the global financial and commodity market, and the transactions are in many ways the simplest.

An over the counter (or OTC) bargain is no more and no less than a private (ie off formal market) deal between two entities, involving some underlying commodity, financial or physical. It is a bilateral transaction between two counter-parties, normally a buyer, commonly called a 'long' and a seller commonly called a 'short' indicating the direction in which ownership of the commodity would move as a result. Until the arrival of more formal exchanges it was, from the earliest times that business was done in town and village market places, the only method of doing business.

The OTC market covers every bilateral transaction imaginable and ranges from highly commoditised markets to extremely sophisticated and complex ones.

The latter are individually tailored and often highly sophisticated transactions which would never lend themselves to the commoditised framework of an exchange. One familiar example of these is the bulk of the corporate insurance market where each risk whilst generically definable is very specifically prescribed to fit the assets or the potential liability involved. Another, less easy to grasp and understood by few outside its devotees and users is the so-called exotic option market where the transaction is based on a complicated price and event formula which may – or may not – lead to an eventual change of ownership of an underlying asset or a transfer of funds from one party to another.

However the bulk of transactions, both in volume and value are at the commoditised end of the market. The best known example of the former is the global foreign exchange market which has grown from humble trade origins to the colossus it is today. Two others, swaps and repos, I shall describe a little later.

Clearing is potentially a key future element in these commoditised OTC markets. To understand its positioning, it is necessary to recall that the central function of clearing is to remove the counter-party risk from the person with whom the bargain is originally struck, to the relevant clearing house. An exchanges' market participant may undertake, in the course of say a working month, literally thousands of on-market transactions, each theoretically creating a market exposure. But these will all net down or be reduced to one exposure to the clearing house, probably a tiny fraction of the grossed up and aggregated amount and all in one name. In contrast a similar number of OTC contracts will create exposures to each of the counter-parties with whom the participant had traded, some of whom may not be well known or even known at all to him; furthermore although it may be possible to net the exposures at each counter-party, if the latter is a regular trading partner, the participant's exposure to him may run up against prudent limits which may inhibit their ability to do further business together. Although this may be less of a problem for undoubted names trading together, it becomes a serious issue with slightly less than top quality names (who may themselves be large by any standards) and is potentially a dampener on their ability to do OTC business). And of course the sum of these exposures to individual counterparties may well be massive.

In fact as an OTC market becomes more commoditised, ie the underlying product becomes more standardised, simpler, and trading takes place between many participants, a problem additional to counter-party risk comes into play. Margins narrow with competition, whilst the cost of trading and the back office and risk management procedures remain the same. The relevant OTC market becomes less and less profitable, and there is an increasing demand for such a market to become exchange traded or at least cleared. The obverse of this is that the marketing

departments of exchanges are constantly looking for new products amongst burgeoning and increasingly commoditised OTC markets. For this reason many successful exchange traded products have migrated from the OTC market, usually based on the initiative of the relevant exchange, but also with the connivance of the OTC participants who see the opportunity to improve dwindling profitability.

Nonetheless there are frustrations for exchanges. Where such products are relatively close relations to exchange products they can have a strong exchange branding. I instance the family of so-called 'flex' options, the specification for which is remarkably like the basic exchange product; the latter however has fixed expiry dates, whereas a 'flex' option allows the parties to the business to agree their own expiry dates – hence their 'flexibility'.

But others are not so close to existing exchange products, although very standardised, and with market potential many times more than standard exchange traded products. I refer as a topical example to repos and swaps. These are far from cocktail party topics, but in layman's terms they arise respectively as follows: a repo (from repurchase) is really a loan or deposit secured on a specific instrument, and thus a gilt repo consists of the 'long' buying a nominated gilt against the 'short's' undertaking to buy it back again on a certain date. In effect in the event of the short failing in his obligation to repurchase, the long has the ownership of the gilt and can sell it to make good his loss if any. Likewise a swap is a bilateral agreement between two parties to exchange the obligation to pay interest on a floating rate (ie the rate being reset at regular intervals) with an obligation to pay on a fixed rate (ie the rate being fixed for the life of the transaction). These two types of bargain, arcane to the non-financial observer have grown into huge markets and highly commoditised. What an opportunity!

However are two increasingly high barriers for exchanges. For a start do clearing houses need them? Exchanges have traditionally supplied the front end for clearing in terms of marketing and much of the backend in terms of systems and administration. But there is absolutely no reason why such functions should not be undertaken by clearing houses.

As importantly are they in a regulatory position to pursue such opportunities? Certainly regulators may be inclined to take the view that exchanges should always run a 'proper' market in their products, meaning a liquid and transparent one. If all they are providing is a standardised contract, branding and clearing, with no continuous related market, it is hard to argue that a proper market in its own right exists. This may have the effect of preventing exchanges who run into this regulatory hurdle from venturing further into OTC markets.

Perhaps the most visible and certainly the most important recent event in this entire saga has been LCH'sw launch of its Swapclear and Repoclear products, clearing and administering eponymous products, based on its own marketing, and systems, as an independent and under its own brand. In this it was more than slightly in competition with LIFFE which also had its own swap based product – albeit an entirely different model – and which would dearly loved to have at the very least co-branded LCH innovative launches.

All this leads to the $64,000 question: can clearing houses, indeed should they, pursue an independent strategy? Traditionally tied to the exchange whose contracts they clear, it was hard to see how they needed to look further. Two things have changed that perception. First it is clear that they have a huge OTC opportunity and one which could be, indeed from a regulatory point of view perhaps must be, tapped by them alone. Second, as I have argued in my last lecture and above ,too, common clearing or clearing more than one exchange at a single clearing house is, alongside the pooling franchises, the one sensible rationale for strategic partnerships between exchanges. In other words the supreme irony is that it may be a clearing house's very independence which proves to be a key support for an exchange.

Furthermore as in the case of LCH, the deeply scarring impact of LIFFE's temporary decline following the loss of the Bund contract may impel a clearing house, as a matter of prudent strategy to seek an independent course.

From 1993 until the resolution of the matter in 1996, I was convinced that it was in LIFFE's interest to seize the opportunity offered by the great clearing banks and achieve greater control over LCH. My failure to achieve a quick consensus on the LIFFE board and the hideous problem of a balance solution which protected the rights of LME and IPE – who were for historic reasons deeply suspicious of what LIFFE might do if it had too tight a grip – were my first, wounding but not fatal experiences of the problems associated with governance and strategic decision making at the top of a co-operative. Nobody really wanted a change, and my initiatives were, I think, seen in part as self-seeking. Certainly there was little agreement or ownership of the problem on the Board. I was deeply disappointed that the final solution gave the exchange a say, but no real strategic driving capacity, and I was privately gratified when the new Chairman finally persuaded the Board a year ago that LCH needed to be well and truly in LIFFE's sphere of influence and set out his stall publicly on that account. But I now think that there are strong arguments for saying that, although I, and they, were right in the short term, we were wrong in the long term, given where we stand today.

Not only is it in LIFFE's interests for LCH to be independent and possibly wholly so, putatively at the centre of a sort of club of exchanges cleared there – starting with IPE and LME – as I have argued, but it is clearly in London's interests that LCH should be as powerful as possible. I have argued that in the era of virtual, globally distributed exchanges, their whereabouts does not matter. What really matters is where the decision makers, traders, brokers and fund managers are.

The co-operative nature of LCH, owned by its members and working effectively and very much with the grain, is based on physical governance in London and it is this real sense of ownership and control over direction that adds significantly to its attraction. I shall expand on the theme of why mutuality works under these type of circumstances, and not for instance for exchanges, at a later lecture. Suffice to say that this very attraction also increases the importance of residing key decision makers in London, and it is possible to say in a very real sense that business is cleared 'in London'.

And a further enhancement is the recently announced probability of LCH becoming the central counter-party for the London Stock Exchange, principally to provide anonymity to participants in the latter.

This in itself raises the fascinating question of the identity of a single central counter-party – yet to be agreed – for the putative alliance of European Stock Exchanges, and in particularly LCH's rivalry with the Frankfurt based Eurex, whose clearing house Deutsche Borse Clearing is merging with Cedel International, a major independent clearing and settlement organisation.

I would argue that LCH's independence, co-operative ownership in the hands of the global financial community, and multi-exchange positioning puts it in a remarkably strong position to assume this role if it ever comes into existence.

In my previous lecture I suggested that this alliance might indeed only achieve modest levels of collaboration centred round settlement but that I could envision a scenario where, turning back from less than satisfactory alliances in the US, LIFFE, then combined with LSE and both using LCH, were to consider merger with Eurex. It would, I argued, make an ideal commercial and

strategic fit. On the same logic it would be natural that LCH should clear the massive exchange that emerged.

The users of such an exchange, and indeed any electronic exchange with global distribution, could be located anywhere, for the screens on which they trade would be scattered round the world. But LCH could not, for it is truly a London institution, and is therefore a key London resource.

Furthermore, the sheer magnitude of its opportunity, not just in clearing many exchanges, and linking with the clearing houses of many more, but also as it pursues an independent strategy into the OTC market, is one which it potentially shares with any other clearing house with the drive and vision to adopt the same strategy.

And so the bottom line is this. While exchanges face a future of consolidation and uncertainty through increased competition and pressure on profitability in the electronic era, clearing house can still provide value added services in a market with vast untapped potential. Which then has the greater economic value for the future, in their own right and in the financial centres in which they are located?

© Daniel Hodson

GRESHAM COLLEGE

Policy & Objectives

An independently funded educational institution, Gresham College exists

- to continue the free public lectures which have been given for 400 years, and to reinterpret the 'new learning' of Sir Thomas Gresham's day in contemporary terms;
- to engage in study, teaching and research, particularly in those disciplines represented by the Gresham Professors;
- to foster academic consideration of contemporary problems;
- to challenge those who live or work in the City of London to engage in intellectual debate on those subjects in which the City has a proper concern; and to provide a window on the City for learned societies, both national and international.

Gresham College, Barnard's Inn Hall, Holborn, London EC1N 2HH
Tel: 020 7831 0575 Fax: 020 7831 5208
e-mail: enquiries@gresham.ac.uk