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Cover Picture:
Statue of Simon de Montfort on the Clock Tower, Leicester.

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THE HEYDAY OF ELECTIONS AND ELECTIONEERING

Presidential Address delivered on October 5th, 1992

by Maurice H. Bailey

The first question which has to be addressed is "when?". If there ever was a heyday for elections and electioneering when was it? I want to suggest that it spanned a period of some 90 years - certainly not a full century. Naming a year when it began is not entirely easy, but the most obvious arbitrary choice is 1872. Harold Wilson's first two elections of 1964 and 1966 marked its final Indian summer and thereafter electioneering ceased to be what it had been.

That leads on to the question "why"? Why were there such radical changes in the nature and style of elections and electioneering from around 1872 onwards? There had been extensive popular political activity in the earlier decades of the century. The political indoctrination of British working men began around 1800 when a groundswell of opinion developed demanding reform, but no immediate gains were made. The first Reform Act was passed in 1832, but for all its high profile in our constitutional history it was a somewhat limited measure. Its most significant changes involved a reworking of the electoral map with many small and even non-existent boroughs losing separate parliamentary representation. At the same time large urban centres like Manchester and Birmingham were given separate representation for the first time. What the first Reform Act did less effectively was to enlarge the franchise. Voting qualifications were to some extent simplified and rationalised and the right to vote was extended to those middle class men of substance and respectability who it was expedient should be enfranchised. The outcome was only a modest increase in the number of electors from around half a million to some 813,000.

At the root of the change which began around 1872 was the fact that in a period of five years two new measures by way of constitutional reform were enacted. The first was the Second Reform Act of 1867. The other was the Ballot Act of 1872. The Second Reform Act was less concerned with redistributing parliamentary seats than with enlarging the franchise. Its most radical feature was the granting of the vote in the boroughs to all male householders and to lodgers paying an annual rental of £10. At a stroke the electorate was doubled. From 1,364,000 it leaped at once to 2,445,000 - over a million new voters. These new voters were almost entirely working class men living in the borough constituencies where they often now formed the majority. Their votes had to be won. And what made this task even more imperative was the passing of the Ballot Act. Prior to 1872 the vote had been exercised openly, but now the secret ballot was adopted and we have used it ever since. The impact of corruption and undue influence was much reduced and in consequence candidates had a further incentive for adopting new and positive strategies for winning votes.

The last thirty years of the 19th century were the period when British politics took on recognisably modern characteristics with the 1880s standing out as the key decade of change. I want to suggest that the circumstances and conditions of this period were particularly favourable for these changes. Certain features were especially helpful. One of the most important was that many working men in the boroughs were already by 1867 politically aware. Working class radicalism had always focused on the belief that parliamentary reform and universal suffrage would be the remedies for all ills, but that radicalism found only intermittent expression and after the collapse of Chartism in 1848 disappeared from the scene in any organised form. And yet it clearly did not die. How it was nurtured is a matter of some conjecture in the absence of first hand evidence, but the secondary evidence is strong. The most powerful influence was education, though not the formal schooling of children. It was done through various organisations, but notably the class system of the Methodist churches and above all the Adult Schools. The Adult School Movement originated in 1845 when two Quaker brothers, Joseph and Charles Sturge, opened a Sunday School for adults at the Severn Street Schools in Birmingham. Known as the Severn Street First Day Adult School it was the prototype for similar schools in industrialised towns all over the country. Illiterate men of all ages from the slums, numbering several hundred, gathered early on Sunday mornings at 7.30 to receive instruction in reading and writing. But if the immediate aim of the school was instructional, it soon developed a wider educational purpose of trying to transform the scholars into good citizens and Christian men and that meant widening their interests to include the social and economic issues of the day. The impact of this work which went on all over the country is impossible to quantify but it was clearly very significant.

Another factor which facilitated the emergence of the new style of politics was radically improved communications throughout the country. In mid-Victorian times parliamentary elections were almost always localised, self-contained affairs with each community choosing someone to represent its interests at Westminster. Often seats were not contested and party politics was only a remote, barely tangible concept. Two developments assisted change in the 1870s. One was the virtual completion of the national railway network. The other was the creation of the penny daily press. Prior to the 1860s newspapers were expensive and limited mainly to weeklies with small circulations. Three legislative changes opened the way to new developments. First came the abolition of the tax on advertisements in 1853. That was followed in 1855 by the abolition of the newspaper tax itself. Finally in 1861 the duty on paper was abolished. The Daily Telegraph was launched in 1855 and selling at a penny it quickly reached a circulation of 155,000 copies. Others soon joined it - the Standard, the Daily News and the Daily Chronicle launched in 1877. Equally important were new local daily papers. In Birmingham, for instance, where
previously there had been a well-established weekly paper, two dailies were launched. In 1862 Avis's *Birmingham Gazette* was transformed into the *Birmingham Daily Gazette* and in 1871 the *Birmingham Daily Post* was launched. All these papers were to have an important role in the new political scene.

But these developments would have been of little avail without two further features. One was the perennial need for entertainment. It is something which can never be ignored. Today we find our entertainment in a vast range of activities - TV, radio, films, the theatre, music, sport both participatory and spectator and so on. Nothing of this existed in the closing decades of the 19th century. Entertainment of a socially acceptable sort for the working classes was available in two places - the churches and particularly the nonconformist churches where the great preachers of the day were often outstanding entertainers as well as being respected spiritual leaders and teachers, and political meetings where the oratorical skills, the persuasiveness and the wit of the new style politicians attracted intense interest. Alongside this we have to add that the years from 1872 onwards offered a rich array of issues around which debate could rage. The scene was set for the heyday of elections and electioneering.

The municipal elections held in November 1872 provided some indications of change. My evidence comes from Birmingham, simply because my own research work done years ago was on the subject of the contribution of Quakers to local government in the town in the 19th century. The *Birmingham Daily Gazette* for 2nd November 1872 reported: *"November the first has brought us to the termination of one of the severest and most exciting municipal contests that has occurred in the borough of Birmingham for many years".* Seven of the thirteen wards were contested. And for the first time all of these contests were dominated by political considerations. It has to be said that at this time Birmingham was almost unquestionably the most politicised town in the country. The principal issue was clear and urgent. That issue was sanitation and public health. And of course at that time Birmingham had its own rising new political star in Joseph Chamberlain who was soon to emerge to prominence on the national scene. Political meetings dominated the campaigning. The *Birmingham Daily Gazette* reported that several weeks of canvassing and speech making had been undergone by the candidates and their friends. One of those who supported candidates though not himself a candidate at this election was a Quaker - Richard Cadbury Barrow. The *Birmingham Daily Gazette* reported a meeting at which he spoke. Richard Cadbury Barrow accused the Tory Party of being the instigators of the movement to fight municipal elections on political grounds. *"The Tory party", he said, "had taken the initiative in St Paul's Ward by opposing Mr Joseph Chamberlain (cheers and hisses) and they were doing the same in St Martin's Ward by opposing Mr Pickering (great uproar)".* The new and emerging flavour of electioneering is clear.

Local elections continued to provide indications of change. For instance the total number of electors casting their vote rose significantly. In 1872 an average poll for a Birmingham ward was around 650 to 700. In November 1873 that figure rose dramatically. In one ward contested by Richard Cadbury Barrow the total number of votes rose to almost 1900 and in another contested by a Quaker it was over 2000. That contest took place in one of the poorest and most deprived wards in the town and the *Birmingham Daily Post* recorded that the successful candidate had the active support of Dr R.W. Dale and a group of scholars from his class in the Severn Street Advent School. Dr Dale was for around 40 years the minister of Camp Hill Congregational Church in Birmingham - one of the most notable preachers of his day occupying one of the most prestigious pulpits in the country.

A third Birmingham election from the 1870s illustrates how over a period of several years the old and the new styles of electioneering co-existed and challenged each other strongly with the new emerging triumphant. This was a by-election held in the Rotton Park Ward of the town in July 1878. It was an election of considerable significance. In the mid-1870s the Liberals had secured sweeping successes and under the leadership of Joseph Chamberlain dominated the town council. However in November 1877 the Conservatives mounted a credible challenge in this ward. Naturally the Liberals were anxious to avoid a possible defeat and so they needed a strong candidate. George Cadbury, who with his older brother Richard had by this time formed their chocolate and cocoa business, was adopted. What followed was an exciting and bitter struggle. George Cadbury was a well known and much respected Quaker who was keenly interested in municipal politics, but he had not previously been actively involved. At the same time he also held very radical views on the temperance issue and was in consequence deeply disliked by the drink interest. In this election the Conservatives and the Licensed Victuallers Association were in open alliance with the Conservative candidate, a Dr Burton, campaigning under the slogan "Vote for Beer and Burton". On the day following the election the *Birmingham Daily Post*, which it has to be said was then a Liberal paper, carried an indignant report of the goings-on on election day itself. It described scenes of a most discreditable character.

In Cope Street, Stour Street, Steward Street, Ingleby Street, Dudley Road, Winson Green Road, Heath Street, Icknield Port Road, Icknield Square, Hyde Road, and Clark Street, beer could be had as freely as rain-water. Numbers of voters on Dr Burton's behalf were taken from the public-houses, and this was openly done in polling districts one, two, three, four, five and six, but more especially in one and two districts. During the whole of the polling day men were seen coming from Dr Burton's committee room, and parading Steward Street with jugs of beer in their hands, on which were pasted papers, "Vote for Burton". When the votes were being counted in the Board Schools, Steward Street, a violent conflict was going on in Dr Burton's committee room opposite, and in the same locality drunkenness and other degrading scenes were continued long after the poll closed. Outside Dr Burton's committee room in Clark Street men and women were sitting on the pavement, and beer was supplied as freely and as openly as possible during the whole of the day. The contest was entered upon with a full knowledge that whatever influence the public-house could use would be used against Mr Cadbury; and this influence was not confined to the day of the election, but was exercised the whole of the previous week.

This was not untypical of the sort of corruption employed in elections prior to the 1870s, but it was of no avail and George Cadbury won comfortably.

Turning to the national scene the general election of 1880 has with some justification been described as the first modern
In one important respect it was not a general election as we know them in that voting did not take place all over the country on the same day. That did not happen for the first time until 1918. Instead the time honoured procedure was followed with constituencies voting on different days over a period of about three weeks. Nevertheless this election saw at least three significant developments. The first was in the number of seats contested. The general elections of 1868 and 1874 had aroused great interest with the number of contested seats rising, but in 1880 that number increased to around five-sixths of all constituencies. Only 109 seats remained uncontroled. Secondly the 1880 election produced the first national campaign as distinct from the sporadic, localised contests of the mid-Victorian period. This campaign developed from Gladstone’s determination to reverse the imperial and foreign policy of Disraeli if he were returned with a majority. This completed the polarisation of political loyalties which had been going on since the mid-1860s and from this point the two-party structure was sharply defined and well-organised. Thirdly in the 1880 election Gladstone introduced a new method of electioneering to this country. This was the whistle-stop tour with its stump oratory. What happened is known as the Midlothian campaigns. Gladstone had been persuaded by Lord Roseberry to stand as a candidate in Midlothian for the general election which was likely in 1880. This provided him with an opportunity to carry his attack on Disraeli and his Conservative government to the country. In November 1879 he undertook the first Midlothian campaign travelling by train from London to Edinburgh and stepping off at Grantham, York and Newcastle to deliver short speeches on the station platform to whoever would listen to him. Then he spent a fortnight visiting towns in the county with an intensive programme of two speeches each day. Thousands attended these meetings and Gladstone’s words were recorded by eager journalists to be reprinted in papers all over the country. This exercise was repeated in March 1880 after Parliament had been dissolved with Gladstone travelling this time from Liverpool to Edinburgh. And of course his meetings were often the occasion for additional attractions such as bonfires, fireworks displays and torch-carrying processions. The Times dismissed the exercise with haughty disdain. “We have only to imagine, if we can, a Pitt or a Castlereagh stumpng the provinces and taking into his confidence, not merely a handful of electors, but any crowd he could collect in any part of this island”. However the new style of electioneering was now firmly established with public meetings - often mass meetings - dominating the scene.

However the most significant politician of the period and the man who more than anyone else occupied the pivotal role in British politics for the next twenty-five years was Joseph Chamberlain. This is not the occasion for a lecture about him, but in order to appreciate his significance in electioneering terms a brief outline of his remarkable career is relevant. Born in 1836 in Camberwell in London his family were Unitarians with a solid, respectable business background. He moved to Birmingham in 1854 at the age of 18 to join his cousin Joseph Nettlefold in a newly created business manufacturing the equally newly developed pointed screw for fixing woodwork. The firm not only achieved a near monopoly in the domestic market, but also seized a major part of the world trade. Twenty years later in 1874 Chamberlain sold his interest in the firm which went on to become Guest, Keen and Nettlefold and is now the international giant GKN. And so by the age of 38 Chamberlain was a very wealthy man free to devote the rest of his life to politics. I have already said something of his contribution to local government. In 1876 he was returned unopposed as an MP for Birmingham and so began his rise to prominence on the national scene. Politically Chamberlain was in those days an extreme Radical whose views and campaigns across a very wide spectrum of issues attracted every response from adulation to hatred but never indifference. He was never to be prime minister and yet he had more impact on British politics than almost any prime minister. In 1886 he split the Liberal Party irretrievably over the question of Irish Home Rule and led a large minority of its MPs as Liberal Unionists into alliance with the Conservatives. In 1899 as Colonial Secretary in Salisbury’s Government - a post of his own choosing - he led the country into the Boer War in South Africa. Then in 1905 he split the Conservatives over the issue of Tariff Reform. But in addition to the major issues with which he grappled and also his outstanding skills as a political organiser, his great legacy was his political style and the excitement of the public debate that he aroused. He was the outstanding political orator of his day with a style of speech making that was bold, combative and electrifying.

One of his great skills on the political platform was his ability to master his audience and to handle noisy hecklers. One ploy which he enjoyed using was to bait his opponents and one of the topics with which he taunted them very often was his claim that there was no such thing as a Tory working man. At one meeting in Birmingham he played on this theme repeatedly and in the end one chap in the audience could stand it no longer. He leapt to his feet and shouted out “I’m a Tory working man. Have been all my life and will remain one.” In silence Chamberlain held the man momentarily in his steely gaze. He adjusted his monocle - he always wore an eyepiece - and then retorted “Wonder of wonders, often spoken of but never before seen. Seize him gentlemen, seize him and we will have him in a museum.” And the audience roared in gales of laughter at the poor chap’s expense.

Political meetings in those days were very often exciting and sometimes unruly affairs and with Chamberlain established as a national political leader it was perhaps inevitable that some of the most notable clashes should take place in Birmingham. The Liberals stranglehold on the town’s politics had been firmly established by the mid-1870s. In the 1874 general election all three Birmingham MPs were Liberals and all were returned unopposed. In the 1875 municipal elections twelve Liberals were returned unopposed, as against one
Conservative, and in the three contested elections the Liberals had large majorities. At the same time the Birmingham Liberals created their new and highly effective local party organisation. This was the Birmingham Liberal Association, but usually known simply as the Caucus. Then in 1877 the National Liberal Federation, the party's new national organisation, was inaugurated in Birmingham with its headquarters in the town. Inevitably the Conservatives were briefly disheartened, but they began to rally and in the 1880 general election their two local candidates, although defeated, achieved very respectable results. This led Birmingham Conservatives to take a bold initiative. By the early 1880s the party had found a gladiator of its own in the mercurial Lord Randolph Churchill, father of Winston Churchill, and a brilliant political orator. In 1884 the Birmingham Conservatives invited him to join Colonel Fred Burnaby, who had been a candidate in 1880, in contesting the next general election.

Churchill decided to take an early opportunity to challenge Chamberlain and the Caucus by holding a mass meeting in Aston Park on 13th October 1884. Bands and a firework display were promised to supplement the attractions of the orators. 120,000 tickets were printed and the first batches sold with suspicious rapidity. When it was discovered that Liberal and Trade Union organisations were buying them almost by the thousand, their issue was curtailed. But the Birmingham Liberals were not without resource, and rumours began to spread that more tickets were being forged. The Conservative leaders had a foretaste of what to expect on the evening of October 12th when a banquet was held in the Exchange Assembly Rooms in honour of Lord Randolph. So great and threatening was the crowd that gathered outside that Lord Randolph was returned to the Grand Hotel by a devious route. Colonel Burnaby, however, marched through the crowd amid tumultuous cheers and boos and finished by making a somewhat disjointed but nonetheless wildly applauded speech in front of the hotel. Churchill's biographer, A.L. Kennedy, describes what happened on the next day:

On the afternoon of the 13th all the great Liberal firms in the city decided on a sudden impulse to close for the remainder of the day. An unofficial meeting of Liberals was held in Witton Road, which, by a curious coincidence, ran just outside Aston Park. This spontaneous gathering had no time in entering the Park and mingling with the many thousands who had entered with forged tickets. A merry riot then ensued. The Members of Parliament speaking to the crowds were engulfed by stones, potatoes, and chairs, and the platform on which Churchill and Northcote were due to speak was stormed. The diminutive little secretary of the Sparkbrook Club fought off the assault with the aid of chair-legs and a walking stick before being overcome by the surging mass that poured over the platform. Grabbing his pince-nez, the little man made his escape, belabouring all around him with his stick until he had fought his way out of the melee. Lord Randolph was seized by a burly admirer and carried bodily away. They were pursued by the crowd, and Lady Randolph herself was molested. She was defended by Colonel Burnaby, a man of immense strength, who flung two of the louts on to the ground, and thereby discouraged further interference. Burnaby then leant cautiously against a lamp-post and smoked a cigar while engaging in suitable back-chat with the crowd. They left chaos behind them; one Member of Parliament just managed to escape through a window before the door of the room in which he was hiding was battered down; the floor of the Skating Rink collapsed in the middle of a free fight, and the much vaunted firework display was fired off amid derisive cheers in broad daylight. It was nothing short of a miracle that no one was killed in the furious melee.

Chamberlain's indignant denial that he had instigated the Aston Riots was greeted with howls of disbelief by Midland Toryism, which continued to lay responsibility for the riots at the door of the much-hated Caucus. Lord Randolph was extremely excited: "My God", he said to Dilke, "there will be somebody killed at Birmingham next time".

Sadly there was, but not for some years. It is important to stress that although political meetings almost always aroused great interest and often intense feelings, they were not occasions when individuals suffered physical injury. The occasional bruised eye or bloodied nose were not entirely unknown, but nothing more. But on 18th December 1901 there was a death and in Birmingham, but not in the meeting itself. At the heart of the controversy was an issue which had aroused opinions to a white heat of intensity. That issue was the Boer War which began on 13th October 1899. Again Joseph Chamberlain more than any other political leader occupied the central role in that he was widely seen as the architect of the war and the upholder of British interests. Challenging him was the arch opponent of the war, the relatively young, up and coming star of the Radical wing of the Liberal Party, David Lloyd George, who over a period of many months engaged in an unrelenting and increasingly bitter attack on Chamberlain. At times his assaults were wild, unsubstantiated, often unfair, but they were effective. One charge evolved into a bitter feud which angered and wounded both Chamberlain and his family as few political issues were able to do. This arose from the report of a parliamentary committee enquiring into War Office contracts which established that a well-known family firm of the Chamberlains, Kynochs, of which Joe's brother Arthur was chairman, had made excessive profits from War Office contracts for cordite. What Lloyd George did by innuendo was to link these high dividends with Joe's involvement with the war. What made the pain worse was that Chamberlain knew, and he was certain that Lloyd George knew, that the charges against him were unfounded, but he was unable to make this clear until the report was debated in the House. There was much personal risk involved in such a sustained denunciation of a popular and powerful figure who was then at the height of his career, but Lloyd George never lacked courage, including physical courage.

Late in 1901 Lloyd George decided to carry the fight to Chamberlain's home ground by addressing a Liberal Party meeting on 18th December in Birmingham Town Hall. To Chamberlain's supporters, who idolised him as a hero, this was seen as an outrage. Well before the event the Birmingham papers were reporting, even inviting, protests against Lloyd George's appearance. They suggested that the patriotic men of Birmingham would never allow the slanderer of Joseph Chamberlain to appear. Lloyd George, even against police advice, took the calculated decision to go ahead with the meeting. On the afternoon of the 18th a massive crowd gathered at New Street Station to meet the London train, but Lloyd George had arrived earlier. In the evening he was driven to the Town Hall and somehow managed to enter unnoticed by a side door. A crowd of around 30,000 had assembled with 350 policemen on duty. When the doors of
the Town Hall were opened, the mob stormed in and pandemonium broke out. Soon the platform party appeared and the tumult intensified still further, only for it to heighten again when Lloyd George stood up to speak. He only uttered a few words, which even reporters sitting against the platform could not hear. Suddenly, as if at a signal, the crowd charged the platform, pelting the speaker with stones, bottles, sticks and anything else that came to hand. There was now no question of Lloyd George delivering his speech. The only question was whether he would leave the Town Hall alive. The Chief Constable hustled him from the platform and told him that the only way he could escape without serious injury would be disguised in a police uniform. Reluctantly he agreed and soon a little column of 12 policemen with Lloyd George in the middle, wearing a coat and helmet, emerged from the building and pushed its way through the crowd which at that point was chiefly concerned with battering down the main door of the hall. The ruse was successful and soon Lloyd George was back at the house in Hagley Road where he was staying with a police guard outside for the rest of the night. The crowd lingered on outside the Town Hall well after Lloyd George had gone and was finally dispersed at around 10 o’clock by a fierce police baton charge in which many were hurt and one man was killed.

This was the dark side of electioneering in its heyday. Rarely did political feelings reach such a degree of intensity in later years except for a limited number of occasions in the 1930s, but throughout the whole of the first half of this century political interest and involvement remained strong up to and including the 1945 election. In the 1950s interest waned a little, only for it to revive briefly for the 1964 and 1966 elections. Harold Wilson’s achievements as prime minister have often been criticised, but his skills as a politician have never been seriously doubted. With his Yorkshire nonconformist background, his ready wit and his oratorical talents he was well fitted to employ the methods of traditional electioneering. In October of last year Robert Harris wrote an article about Harold Wilson for the *Sunday Times*. It began in this way:

In 1966 the American director Joseph Strick rather improbably made a film about the British general election. Shot in black and white, and called The Hecklers, it records a style of electioneering fast becoming as remote as Gladstone's Midlothian campaign. No bland ticket-only meetings and tedious photo-opportunities in 1966: instead, a series of mass rallies open to all-comers in cities such as Cardiff, Manchester and Leicester, where party leaders did not speak to their audiences so much as struggle to subdue them. The star of The Hecklers is Harold Wilson.

A young man marches to the platform and throws a pile of leaflets at the prime minister; they miss, "Your aim, says Wilson, "is as good as your material". He promises carefully costed increases in public expenditure. A left-winger shouts: "What about Vietnam?". Wilson pauses, turns (it is all in the timing): "The government has no plans to increase expenditure in Vietnam". An empire loyalist has a try over Rhodesia: "Why are you talking to savages?". Wilson: "We don’t talk to savages. We just let them come to our meetings."

Harold Wilson was the last of the old style electioneers. Today that style is fast becoming an increasingly distant memory. Politicians now use very different methods which are media based with spin doctors determining each day of the campaign what issues are to be discussed. This has stripped the spontaneity and the personal involvement from our elections and for many of us they have become a bore. Perhaps the last election, however, offered one ray of hope. John Major, against all advice, got out his soapbox, stood on it and addressed anyone who would listen. He is no Gladstone or Chamberlain or Lloyd George, but perhaps his efforts will encourage others to develop their talents and then the interest and personal involvement and fun will return.

Maurice H. Bailey, M.A.
1 Beresford Drive,
Leicester. LE2 3LB.
SIMON DE MONTFORT, EARL OF LEICESTER AND THE IMAGE OF THIRTEENTH CENTURY CHIVALRY

Daniel Williams

Summary of Lecture delivered on January 6th. 1992

In the last disastrous phase of the English defeat at Bannockburn in 1314 the earl of Hereford ordered Sir Giles d'Argentein and the twenty or so knights of his "banner", to break through the Scottish line and escort King Edward II to the safety of Stirling Castle. With consummate professional skill Sir Giles and his troop accomplished their dangerous task. When the King urged the knight not to return to the already lost battle, Argentein replied "Sire I do not run away". The two men departed to their destinies of failure and glory. Giles and his knights returned to the battle. None survived. The banneret himself died impaled upon Scottish spears in a last desperate single handed charge. For this act of glorious futility, Sir Giles d'Argentein was proclaimed the third most chivalrous knight in Christendom.

From its origins in a tenth century code of conduct, chivalry by 1314 had developed into a tangible attribute that could be measured. Of greater importance to contemporaries Giles standing as a chivalrous knight was predicated upon generations of such conduct by the Argenteins. Their was an illustrious history of honourable warfare in all the right and just causes. His great uncle Sir Reginald d'Argentein, a Templar of distinguished bravery was killed by the Saracens in 1237. His grandfather Sir Richard was described as a "mighty knight who fought for God in the Holy Land". A dynasty of crusaders who had noblesse and lineage to live up to. Giles' father, also Sir Giles, is the most germane to this lecture, however, for he, true to the glittering traditions of his ancestry led his banner of knights on the field of Evesham in support of Simon de Montfort where he was left for dead, having fought for a cause regarded by many Englishmen as of equal worth to that of a Holy War.

These events and circumstances are central to our understanding of the chivalric image of Earl Simon enshrined in his stained glass portrait in the choir clerestory window of Chartres Cathedral and his equestrian statue before the Palace of Westminster to commemorate the cause for which he died in 1265.

To contemporaries, Simon was even a saint and a martyr. In the margin of a late thirteenth-century Canterbury Register an unknown monk wrote "Blessed is the Baron Simon". There are numerous other such references. A poem in praise of the Earl now at Jesus College, Cambridge, goes even further:

In the Year of Our Lord 1265, the eighth year of (the reign of) Simon de Montfort and his associates on the fourth of August. That is the date of his martyrdom at Evesham when a darkness fell upon the land as at the crucifixion:

Simon de Montfort, Saint, Martyr, Reformer, King, the essence of chivalry that lies in the apotheosis of the warrior, the champion of the liberties of Englishmen, one of the founder fathers of the Church in England along with St. Thomas Becket and the greatest of England's uncanonical saints Robert Grosseteste, Bishop of Lincoln. For Robert Grosseteste was the inspiration behind Simon's just cause. According to William Rishanger, a monk of St, Albans:

The said bishop (Grosseteste) is related to have urged the Earl for the remission of his sins that he should take up that cause for which he fought even into death: declaring that the peace of the Ecclesia Anglicana could never be secured

without the Temporal Sword and constantly affirming that all who died in her and for her would receive the crown of martyrdom.

We must see Simon de Montfort as a thirteenth century figure of enormous importance within a whole spectrum of contemporary opinion not myopically as a constitutional reformer. This is not to deny the constitutional element. Post-Conquest Anglo-Norman society was indeed characterised by an uneasy balance between the centripetal power of the feudal monarchy created by the Conqueror and the older centrifugal forces within continental feudal society brought to England by companions of the Conqueror like the Earls of Leicester. So long as the crown remained powerful and in control the history of medieval England was the history of its kings. At times of weak monarchy the great feudal lords emerge as the real arbiters of the nation's destiny.

Between 1258 and 1265, as the Salve Symon poem describes, England was ruled by Earl Simon and his associates, with their vision of a kingdom governed in the interests of the community of all free subjects and not as the personal property of the monarch. He was trusted as a reformer from 1258 but finally chosen as the leader of the barons in 1263 not because of his constitutional beliefs though they stimulated his acceptance of the challenge.

The earl was chosen leader because of his renown, his international standing, his chivalry. Above all for his recognised human qualities, his courage, his steadfastness, his ability to lead and inspire. His leadership resulted in one of the greatest crises in the history of English monarchy which is why the crown has never forgiven Simon de Montfort. In the event it was rescued by a prince much more in the mould of his uncle the Earl of Leicester than his father Henry III. Like all the young men who knew him the Lord Edward had come under Simon's spell though not, it would seem, for long enough. The future King, the chivalrous leopard, beautiful but treacherous in his victory at Evesham learnt everything from the vanquished Simon except what he actually wanted to teach him; faithfulness, dedication to his subjects interests and above all chivalry.

"Chivalry" wrote Noel Denholm-Young "is impossible without the horse". It was a code of conduct to give a christian purpose to the brutal mounted warrior who came, in the eleventh century, to dominate the battle field. The crusades were a direct consequence of the process whereby
the brutality of the warrior was to be ameliorated by the
Christian virtues of spiritual dedication and charity.

The earliest expressions of this purpose are to be found in
liturgies performed on the occasion of the granting of arms
and armour to the young warrior. An early one from the
archives of Rouen reads:

 Listen oh Lord to our prayers and bless with the hand of your
majesty this sword which your servant wishes to dedicate to
the defence and protection of churches, widows and orphans
and all the servants of God against the cruelty of the heathen
and to be the terror of all those who hold them in bondage.

By the end of the eleventh century chivalry became a defined
set of principles for knightly conduct like those given in
Bonizone of Sutri's Book of Christian Life.

To these were added a more mystical quest for salvation and
self-knowledge as seen in the medieval cycles of the
Arthurian Legend. This is most beautifully expressed in the
words of the Gesta Francorum.

Brothers you must suffer in the name of Christ many things,
wretchedness, poverty, nakedness, persecution, need,
sickness, hunger, thirst... you must suffer many things for
my name... and great will be your reward.

All very fine but there were potential contradictions in
practice. Sutri's principle, for example, that a knight should
always be faithful to his liege lord. What if your lord orders
you to break your word or to deny your faith? There were
grounds for real conflict here.

Indeed such conflicts pervade the chivalric literature of the
next two centuries. The theme of the Spanish Poem of the
Cid is of a vassal wronged by his lord. Even the Life of
William the Marshall, a largely true account of one of the
greatest knights of Christendom who died in 1219, tells us
that William can only react to his lord King John with
forbearance and patient loyalty. Though the writer of the
Life clearly sees John as a paranoid, unchivalrous and
faithless King. By the thirteenth century when medieval
society came of age, loyalties had become more sophisticated,
more abstract, more diffuse. Chivalry was now more
attached to principles than individuals, however exalted.
The common good was coming to be recognised as a better basis
for personal relationships and for government than the will of
the prince alone. One fundamental principle however could
not change. A knight could not break his promise or oath.
The church might absolve him but not the honour of
knighthood.

There was a further change with past values in thirteenth
century chivalry that made William the Marshall's ideal of
socially mobile warriors rising in the world rather
old-fashioned. There was a new emphasis upon knightly
exclusiveness embodied in the concept of noblesse, nobility:
the nobility of ancestry and lineage like that of the
Argenteins. It amounted to a closing of social barriers and
upper class ranks. Ancient, atavistic lineage was given a
distinct edge over current knightly conduct. We see this most
clearly in the rules of the crusading Order of Knights
Templar. Twelfth century ordinances divided the brothers
into two orders, knights with their white mantles and
sergeants who wore brown. It was considered possible even
desirable, for the latter to be dubbed for acts of valour and
service and be elevated to the higher order of knighthood. In
the thirteenth century the rule was changed. No one could
become a knight of the order unless he could prove that he
was the true son of a knight and a lady of gentle blood and
descended on his father's side at least from an ancient family
of knights: in truth a hardening of the rules of ancestry
whereby blood was more important than conduct. Lineage
enhanced conduct, conduct on its own was no longer
sufficient.

As Jean de Meun argued "in gentility (that is chivalrous
actions) there is no good unless a man seeks to emulate the
prowess of his ancestors". The great majority of his upper
class contemporaries would have agreed. This new
exclusiveness, this noblesse, is clearly apparent in the
surviving accounts of the last days of the de Montfort
ascendancy. The Chronicle of Melrose and its related
documents are a particularly apposite source in this respect.
The chronicle describes Edward's surprise attack upon the De
Montfort stronghold at Kenilworth castigated as a night raid
contrary to the rules of war. During this action Simon de
Montfort junior and other young "nobles" were taken by
surprise in the village of Kenilworth, not in the castle. Some
were captured; many got away but all lost their horses and
armour. The chronicler comments:

In the morning the foot soldiers who the day before had
followed at the tails of the knight's horses clothed themselves
in the armour of those noble men who had escaped and
mounted their horses... When all those rascally fellows
came to Edward well armed and riding upon the horses of
the noble men he (Edward) rejoiced with exceeding great joy.

Melrose makes the point that the Lord Edward's followers
were not chivalrous, nor was the conduct of their leader.

Simon, on the other hand, was, and had been selected by the
barons as their leader because of his noblesse, his ancient
and illustrious ancestry, his membership by marriage of the
inner-most circle of the royal family. Perhaps the founder of
a new and more noble and chivalrous royal dynasty. No
wonder Henry III feared him and Edward took his revenge on
the entire comital family including Llewelyn, Prince of Wales
who married into it to his dire cost. The Earl of Leicester's
chivalry is most clearly set out in a neglected contemporary
source, The Treatise concerning the illustrious Simon de
Montfort, to be found in the Millrace collection of
documents. The Earl was chosen by the baronial reformers
because:

This Simon was earl of Leicester and the son-in-law of the
King: he was an excellent man, wonderfully skilled and
circumspect in the organisation of war and carrying it out in
practice based upon sound planning. He was a good soldier
and also had been knighted and from these considerations the
barons selected him to direct them as well in their councils as
in the war. By birth he was a Frenchman descended from
one of the most noble and powerful families in the whole of
France: and he did not degenerate from his ancestors but
equalled them (my emphasis). He was a man endowed with
heavenly wisdom and amply provided with knowing
precautions (that is a good field commander).

All this is echoed in the chivalric ode in praise of Simon
written in 1263:
The Song of the Barons

Montfort he is rightly called
He is the mount and he is strong
and has great chivalry*
the truth I tell, my honour I swear
he hates the wrong and loves the right
and he shall have victory . . .
He is Leicester's great earl
and Proud and joyful to be of
such renown.

* Si ad grant chevalie

The concept of noblesse is all here, his prowess as a knight in the field, his ancient and illustrious lineage, his ancient title of earl, his royal connections. The paragon, the image of thirteenth-century chivalry, a man who had become a legend in his own life time.

Simon's first visit to England in 1230 to claim his grandmother's inheritance, the Earldom of Leicester has something of the Arthurian Legend about it. Such was his charm and grace at the age of twenty two that he won for himself not only the Earldom but the King's sister Eleanor in marriage. They were a gilded pair. By his homage to King Henry III for the Earldom and the marriage Simon became both English and a member of the royal family.

Here, unfortunately, the fairy tale ended for both Simon and Eleanor. They soon faced the malice of their one time benefactor the King. Yet Simon continued to exercise forbearance and serve his lord loyally in a whole range of important capacities, military, diplomatic, and governmental. In 1252 Henry III and the Earl were locked in a dispute over the government of Gascony. Simon was deprived of all crown support and sent to deal with a serious rebellion in the Duchy. It was in the chronicler Matthew Paris' telling phrase "like David sending Uriah to battle". Despite the earl's brilliant military and diplomatic successes in the Duchy he was forced by his lord into exile. According to Matthew, Simon is reputed to have remarked, "I well know that the King wishes to rob me that he may enrich some Provencal or Poitevin with my Earldom".

At this low point in his English career, Queen Blanche, Regent of France died. The senior French nobles offered the Earl of Leicester the post of guardian of their country, such was his chivalrous reputation. Simon refused because of his oath of fealty to his liege lord, Henry III. It was to be a bitter, even fatal, decision and in the event constituted a great watershed in his life. No one could have doubted his loyalty to his adopted country or his steadfastness in the face of great and continuing provocation. His role might have come straight from the Spanish Poem of the Cid.

God how fine a vassal: were his lord but worthy.

The lines were drawn, the Earl continued to serve so faithless a lord, though unlike William the Marshall, not quite to the end. As the Sicilian adventure led to the crises of 1258 which gave rise to the Baronial Plan of Reform, Simon along with Henry III, the Lord Edward and the other lords of England took the fatal oath to keep the terms of the Provisions of Oxford. The provisions imposed constitutional restraints of a temporary nature upon the Crown in the interests of the community of the realm. This reform movement was one of the most important initiatives in the political history of medieval England. The progressive focus of the many elements of the nation involved in this idealistic movement chosen by his peers in 1263 was Simon de Montfort. His chivalry, inspiration and steadfastness placed him at the head of an unquantifiable majority of his fellow country men. It was his chivalrous adherence to his oath to uphold the Provisions of Oxford which raised the Earl in the eyes of his contemporaries and gave the rebellion that followed its causa justa. In the words of its chronicler William Rishanger:

His constancy all men, even his enemies, admired: for when others had sworn to observe the Provisions of Oxford and for the most part of them despised and rejected that which they had sworn, he having once taken the oath like an immovable pillar stood firm.

This was the verdict of all contemporary writers, historians and chroniclers. According to the Annals of Dunstable there was also a crusading touch that further hallowed the dangerous cause of rebellion. Simon is reputed to have remarked

I am ready either to die amongst bad christians fighting for Holy Church or among pagans as a sworn crusader

All this overwhelming evidence emphasises the personal appeal of the Earl of Leicester, the ageing warrior who still retained in the eyes of contemporaries the chivalric charisma of the gilded knight in the stained-glass window at the Cathedral of Chartres. This appeal to the higher instincts of his class and adopted nation was to be reinforced during the last period of his life by what can only be described as an eagerness for personal martyrdom very similar to that of St Thomas Becket. In November 1263 when cornered between the closed gates of London and a large royalist force:

the earl... armed himself and his men and in the name of God he fastened crosses to both the back and the breast of himself and others. Meanwhile confessing their sins, they all took the Sacrament and made ready to await the onslaught of their enemies and to struggle against them for the sake of truth

In the last moments at Evesham in 1265 he is reputed to have remarked, "let us commend our souls to God because our bodies are theirs".

Such steadfastness and inspiration even to the death, alone explain the ultimate commitment of the most respected and chivalrous knightly families of his day, amongst them as has been seen, the Argenteins of Wymondley, Hertfordshire.

The Earl's idealism and chivalry were particularly potent with the young, the able, the idealistic of thirteenth century English Society. To all elements from the students of Oxford to some of the greatest families of the land, the Earls of Oxford and Gloucester, in particular Humphrey de Bohun son and heir of the Earl of Hereford, who fought against his royalist father at Evesham and was mortally wounded in that battle. Simon's inspiration to the young influenced members of the royal family. Henry of Almain and for a considerable time the Lord Edward himself, fell under the spell of their chivalrous uncle. The contemporary Lament for Simon de
Montfort has a special prayer for the heir to the throne:

Pray all of you, my gentle friends to the son of Mary, that he lead the child the mighty heir, in a godly life; I will not name the youth, I do not wish it to be mentioned: but for the love of the Saviour, pray for the clergy.

The lament itself celebrated what Robert of Gloucester was to call the murder of Evesham on 4th August 1265. That episode in the context of chivalry witnessed "the best of times and the worst of times". Edward by extraordinary military skill and quick thinking learnt no doubt from his uncle the Earl, split the rebel forces and led his arch enemy into a trap by flying the standards of his vanquished son, the spoils of his night attack at Kenilworth. It was an act contrary to the chivalric rules of warfare. Whether the Prince flew the royal dragon standard or not, he was to give no quarter to the rebels. Those who survived the "murder" had been left for dead on the field. Their recovery owed more to chance and a robust constitution than to mercy.

Even Henry III, himself the Earl’s prisoner only survived by pathetically crying out "I am Henry of Winchester your King I am too old to fight". When was he ever not? Simon and his last fighting adherents formed a circle and fought to the death. The warrior earl, invincible to the last, died when a foot soldier crept behind him lifted his hauberk and thrust a spear through his kidneys. Contrary to the code of chivalry his dead body was obscenely mutilated: amongst other things his head was carried on the point of a lance to the castle of Wigmore. What remained was buried in the abbey by the monks of Evesham. Within weeks miracles occurred and the grave became a shrine. This act of mutilation was the cause of a vendetta between the Plantagenets and the De Montforts involving further acts of death and desecration which swept "that accursed progeny" of the De Montforts from the face of the earth.

The victory, the triumph and the vengeance fell to the Lord Edward. By his leopard skills of deception and quick thinking this young knight of barely nineteen rescued the English crown from one of its most dangerous crises. As Simon de Montfort saw the military precision of Edward’s advance upon him at Evesham, he exclaimed "by St James, I taught him that". It was a tragedy for England, Wales and Scotland that the other lessons fell on deaf ears.

A Biographical Note


Dr Daniel Williams
History Department,
University of Leicester,
Leicester. LEI 7RH.
SCIENCE IN THE SUPERMARKET

Sir Geoffrey Allen

Summary of the Royal Society of Chemistry Lecture delivered on October 19th, 1992

Walk down the aisles of any supermarket and you will marvel at the display of foods, toiletries, soaps, detergents and other cleaning aids all formulated for safety, packaged to high standards of hygiene and clearly labelled. Science and technology developed by one company has impacted on almost every type of product on display. Even the fresh vegetables, meat and fruit have benefitted. From the very origins of Unilever, technology played a crucial role in the development of cost effective processes and good quality products with the attributes of safety and reliability. Science displayed in the supermarket stems from two streams of products, edible fats, typified by margarine, and soaps.

MARGARINE

The science and technology involved in margarine enjoys widespread application in other supermarket products, for example ice cream, cooking oils and all pre-processed foods.

For almost a century the aim of all margarine manufacturers was to make a product indistinguishable from butter. Therefore workers in every company concentrated on formulations containing 80% fat and 20% water. Different blends of fats and oils were tried, various ways of churning and chilling the emulsions were developed. Natural and synthetic flavours and emulsifiers were used. The cool impact of melting butter on the palate, the flavour delivery at that instant were prime targets for the margarine scientists.

But in the late 1960s the game began to change. There were some medical reports of the need to curb the hard fat intake as Western appetites enlarged to meet the challenge of the increased availability of foods of all types. Other medical reports pointed to the health benefits of polyunsaturated fats. Thus was born Becel- and Flora-type margarines incorporating larger quantities of sunflower oil - despite the fact that this tended to produce a softer product with less marked palate-cooling properties than butter. Unilever was one of a small number of companies which also began to experiment with margarines containing less fat and (by implication) more water, so called "low fat" spreads. These required better control of bacterial levels, of the dispersion of the water droplets and of crystallisation in order to give a safe and satisfactory product which would contribute to a reduced fat intake for the consumer.

Much research in many food companies has been done over the past 20 years to produce "low fat" and now "very low fat" margarines. Unilever, for example can now offer products with fat content as low as 20%, though proteins have to be incorporated in the aqueous phase involved to give adequate spreadability. Even "no fat" margarines are possible on the laboratory scale. They maintain the same dispersion-type of structure but now the two phases are aqueous gels of protein and carbohydrate respectively - with of course, appropriate flavours. Such products have to be manufactured under stringent conditions of low bacterial count and great care is taken in packing and sealing the low fat products.

For the future, experiments with bacteriociodes which are enzymes or other natural materials promise to give more effective control of bacteria in margarine and other food products. This would enhance the shelf life of many products and may even reduce the need for refrigeration. Margarine-making and modern food processing have become Hi-Tech activities.

SOAPS

Rather curiously the formation and manufacture of soap has evolved on a course parallel with margarine. For many years the formulation of new soaps concentrated on new mixtures of fats leading to different fatty acid compositions and to various ways of controlling the crystallinity of the soap bar - in a manner rather similar to the scientific approach to making margarine more like butter. The difference was that the product now being developed was a smoother, milder soap bar, with less mush and more lather!

About 30 years ago the game changed here too. Proctor and Gamble, Colgate and Unilever were all seeking to make milder forms of conventional soap. Palmolive, Ivory and Lux were the leading brand names. However, a new soap bar based on a synthetic detergent product was introduced. The material is made from the fatty acid derivative of sodium isothionate. The bar of soap made in this way is softer and more slippery than a conventional bar - in fact the block is curved so that it does not squeeze out of the hand and propel itself across the bathroom. It is the mildest toilet bar available and is particularly useful for sensitive skin. Sold under the brand name Dove it is a considerable success in the US of A.

Nevertheless Dove is prone to develop "mush", the price the consumer paid for an ultra-mild product! Now Unilever have a new soap bar which aims to get the best of both worlds. Lever 2000 was launched two years ago in the US of A. It is a blend of conventional soap and Dove and the new bar has intermediate attributes - milder than ordinary soap and less mushy than Dove. You can see from the conventional shape of the bar that it does not transform into a projectile in the bathroom! A blend of two established products may seem a simple solution. In fact it required some very good science and process technology to produce a blend which would give just the right properties in the final product.

Again the science of soaps spills over to many other products - soap powders, shampoos, hard surface cleaners and so on.

Sir Geoffrey Allen, F.R.S., C.Eng.
Kobe Steel Ltd., Alton House,
174/177 High Holborn,
London WC1V 7AA.
THE LIFE AND GRAPHIC WORK OF ERIC FRASER

The Rev. Geoffrey Fraser

Summary of British Gas Lecture delivered on November 2nd. 1992

In 1797, one of the children of the famous Quaker Fox family left the family mill in Somerset and started his own mill at Uffculme in Devon. So the new generation turned from horse power to water power and then through to steam, generated at first by the new gas production unit established at the mill. The mill is now a working industrial museum for the wool industry in the West Country, and keeps alive the fascinating inventiveness of those industrial engineers of whose company young Fox and William Murdoch were but two.

This lecture has been described as in commemoration of William Murdoch who, 200 years ago this year, first demonstrated the use of gas for lighting. Boulton and Watt produced the famous engines and employed William Murdoch to build and erect the engines, particularly in Cornwall. He was only a tradesman in their eyes, and has only recently been recognised for his inventive genius, and in particular for his application of gas for lighting. He was perhaps the first of many distinguished engineers who have made the gas industry the huge and successful enterprise that it is today.

It may be that William Murdoch has not had the honour due to him, because of the zeal of James Watt’s son, who is suspected of having made sure that all the credit went to his father: It may be that tonight, I too honour my father - but not in any way to eclipse the honour due to another.

I come from Devon and from the village of Coldharbour Mill in particular where Fox founded his woollen industry on gas and water, a product of the same period of industry and inventiveness.

I must begin by expressing my thanks and the thanks of my family to British Gas, not only for sponsoring this lecture, but for its sponsorship of the exhibition of my father’s graphic work which has been touring around the country for the past two years. Eric Fraser was the foremost illustrator of the twentieth century, and was the creator of the stylized emblem, Mr Therm. And when I say Eric Fraser and show you some of his drawings, you will also say: "Oh, I remember him!". For Eric Fraser drew (amongst much else) for the Radio Times for over sixty years.

William Murdoch was a problem solver, using his imaginative, creative mind to solve problems presented to him by others. Eric Fraser spent his whole life solving problems presented to him by others. His manner of working was remarkable - meticulous, painstaking and accurate, but without being a slave to photographic correctness of what he was drawing. He would draw out his ideas at first in pencil and on a very small scale, often no larger than a postage stamp. Then when he was clear in his own mind he would draw out the full size drawing in pencil, then in ink, and then often black it all in, working out the drawing again on top in white poster paint. To the onlooker, it all seemed a lengthy process but for him it was the way in which he could assure himself of exactly what he wanted to do, and enabled him to satisfy himself that he had fully explored the potential of what he had to do. It also gave him the means to tackle the final drawing with freedom and with confidence, in a vigorous but controlled way.

The lecturer then showed 42 slides of Eric Fraser’s drawings from the period of the life of Mr. Therm (1930 - 1960), giving a personal point of view about each of them.

The lecture concluded with a buffet provided by British Gas.

Rev. Geoffrey Fraser.
Dalvey House,
46 Priory Road, Great Malvern,
Worcestershire, WR14 3DB.
THE STUFF OF DREAMS:
A VIEW OF SHAKESPEARE’S PLAYS

Mary Mestecky

Summary of Lecture sponsored by the University of Leicester Bookshop and delivered on January 4th 1993.

Quotations drawn from writings as far back in time as The Bible and as recently as this week’s horoscope in the paper of your choice show that attitudes to dreams show a remarkable consistency. They have always been regarded as omens, or predictions, or messengers from another world, or symbolic of one’s psychological hang-ups, or too much cheese for dinner!

The cultural development of the entire medieval Christian world was based on the belief that this world was an illusion, or dream, and that the next world the real one and dreams were treated very seriously in the Middle Ages.

The literary use of dreams goes back a long way. They were used to give emphasis and significance to the earliest writings and the safety afforded by the dream convention allowed writers to express unusual and controversial ideas. To the traditions of English Literature we can look to The Dream of the Rood and The Vision of Piers Ploughman as examples of this.

It is Chaucer, however, who developed the dream formula into a true literary art by completely integrating the idea of the dream into his writings as we can see in The Parliament of Fowls and The House of Fame. He was also prepared to examine a more down-to-earth view of dreams and he uses this approach in The Nun’s Priest’s Tale where both Chanticleer’s dream and Pertelote’s contemptuous treatment of it are at the heart of his story and character development.

Medieval drama had treated dreams more conventionally as messengers from Heaven or Hell, but in Shakespeare’s hands they became a powerful dramatic tool, advancing the plot, revealing character, commenting on the action and creating atmosphere.

Dreams as omens can be seen in Julius Caesar where Calphurnia dreams of what will befall her husband on the Capitol, and in Richard III where a much fuller and dramatic treatment is given both by Richard and Richmond’s dream before the Battle of Bosworth, when a procession of ghosts predicts their respective fates, and by Clarence’s vivid dreams of his own death by drowning.

Both Claudio in Measure for Measure and Hamlet dream of the after-life, but whereas Claudio’s vision is vividly depicted, Hamlet’s offers no view of eternity but concerns itself with this world. In both cases what they dream is consistent with the kind of people they are.

In Othello Iago uses the belief that what is dreamt is what is really felt to torment Othello by telling him of Cassio’s alleged dream of making love to Desdemona. It is another deadly weapon in Iago’s psychological armoury and, indeed, in Shakespeare’s, as it is his knowledge of human nature which enables him to enhance both plot and character through using the dream in this way.

In The Taming of the Shrew the play begins with an unusual "dream" framework: the drunken workman, Christopher Sly, being persuaded that he is a nobleman who has just awoken from a 15 year sleep and shown the play of The Taming of the Shrew as entertainment. Disappointingly Shakespeare makes nothing of this unusual dream versus reality situation which elsewhere in his plays he examines with absorbed interest.

In A Midsummer Night’s Dream, however, there are layers of dreams for us to unwrap. At the end of the play Puck tells us, the audience, that we are only dreaming that we are watching the play, and that the play itself is only a dream. Within this play/dream the characters have their "reality" altered by the potion administered to them in their sleep by Puck. It is all a wonderful example of how to make the dream the drama!

Macbeth, on the other hand, "has murdered sleep" and yet is living a nightmare, the hallucinations of which pervade the play. In Lady Macbeth’s sleepwalking scene some brilliant use is again made of the dream idea and Shakespeare even prefigures modern psycho-analysis in the person of the Doctor who observes her, and in his comments on her condition.

Shakespeare’s continuing interest in the idea of dreams versus reality culminates in his "farewell to the stage" speech in The Tempest, one of his last plays. Here he seems to be content to accept the dissolving of the things of this world into nothingness and calls all mankind "the stuff that dreams are made of "without agonising about where reality lies or what death holds - an acceptance of the dream state which is as old as time itself.

Mary Mestecky,
33 Stanley Street,
Leicester LE11 2EL.
THE HEART OF THE MATTER

David De Bono

Summary of the lecture delivered on January 18th, 1993.

My object in this lecture is to take as a starting point a common "modern" disease, coronary thrombosis, and make a journey back in history to the roots of our understanding of its pathology and the origins of the medicaments used in its treatment.

Coronary thrombosis is so familiar to us: yet a century ago it was regarded as a condition of such extreme rarity that only one case had ever been diagnosed in life, and that in very exceptional circumstances. The great German pathologists, Virchow and Rokitansky, had to be sure diagnosed coronary thrombosis in post-mortem examinations, but had surmised that it was invariably a fatal, indeed an agonal, phenomenon. In 1910 perhaps the most famous physician of his age, Sir William Osler, noted in his Lumenian lectures to the Royal College of Physicians that "coronary thrombosis......is not uncommon in cases of sudden death from angina". In the same year Obrastzov and Straschenko, in Russia, and two years later Herrick, in the USA, gave clinical and pathological accounts of what we would now recognise as coronary thrombosis.

Until the advent of the electrocardiogram, introduced by Einthoven at the turn of the century, it was in fact very difficult to make a diagnosis of myocardial infarction in a living patient. When I was appointed physician to the cardiology department of the Royal Infirmary of Edinburgh fifteen years ago, my immediate predecessor, Dr R.M. Marquis, introduced me to his predecessor, Dr A. Rae Gilchrist. Gilchrist, who is as old as the century (and still alive) was appointed to the Royal Infirmary at the age of 26, having learned the "new" techniques of electrocardiography in Boston. He had to wait two years before making his first diagnosis of myocardial infarction on the wards of the Royal Infirmary. By the time I was appointed, we admitted over 1000 cases a year.

In the absence of electrocardiography, nineteenth century physicians found it difficult to distinguish between the pathological entity of coronary thrombosis and the symptom of angina, classically described by Heberden in 1772. Classically is perhaps doubly appropriate, because Heberden's original paper in the Medical Transactions of the Royal College of Physicians of London was written in Latin! Heberden beautifully described the symptoms of angina, a choking sensation in the chest brought on by exertion and relieved by rest. He also commented that "sooner or later, all those afflicted suddenly drop down dead......!

Simultaneously, the pathological association between angina and coronary artery disease was being established by, among others, Edward Jenner, better known for his work on smallpox vaccination. Jenner was reticent about publishing his results, because his friend and teacher John Hunter, the great experimental pathologist, had all too clearly developed symptoms of angina. In 1776, after attending a somewhat stormy physicians committee meeting at St George's Hospital, he emerged fuming, complained of chest pain, and duly dropped dead. At the postmortem, Jenner found calcified and grossly narrowed coronary arteries. Incidentally, this tradition of reporting eminent medical autopsies continues: the first volume of the British Heart Journal carried an extensive report of the autopsy of the famous cardiologist Sir James Mackenzie, who also died of coronary artery disease.

A superb clinical account of the symptoms and outcome of coronary thrombosis is given, of all places, in Lytton Strachey's "Lives of Eminent Victorians", Describing the death of Matthew Arnold, Headmaster of Rugby School, sometime classicist, poet, and inspirer of Thomas Hughes, he wrote:

"Early the next morning, he awoke with a sharp pain in his chest. The pain increasing, a physician was sent for; and in the meantime Mrs Arnold read aloud to her husband the 51st psalm...... When the physician arrived, he at once perceived the gravity of the case; it was an attack of angina pectoris. He began to prepare some laudanum......, all at once, as the medical man was bending over his glasses, there was a rattle from the bed; a convulsive struggle followed; and when the unhappy women, with all the servants, rushed into the room, Dr Arnold had left his perplexities for ever. (Lytton Strachey, Eminent Victorians, Penguin Modern Classics)."

Note that 40% of all cases of coronary thrombosis still die before reaching hospital, that the commonest time for the onset of an attack is the early morning, that Dr Arnold had an awful family history, and that we still use morphine, a slightly more sophisticated version of Laudanum!

I suppose it is a common medical failing to assess writers of fiction for their accuracy or otherwise in descriptions of diseases or their treatments with which we are familiar. This may account for the popularity of that retired pharmacist, Miss Agatha Christie, with a previous generation of physicians. It is often the marginal asides which ring truer than the set pieces: Lisa Alther's father sadly washing down his post-infarct warfarin with coffee in Kinflicks is deadly accurate: many of the more elaborate scenes with cardiac defibrillators fashioned from bedside lamps are not. For those with strong stomachs, perhaps the best account (I suspect personal) of the horrors of modern American cardiology is given by John Updike in his Roger Rabbit series.

Let us bring Dr Arnold up to date, and consider what might happen to someone having a coronary thrombosis in Leicester today. The Trent regional policy for the management of coronary thrombosis encourages patients to dial 999, rather than wait for their own GP to arrive. If the first call is made to the doctor, he is also encouraged to call an ambulance. This is because all Trent ambulances now carry cardiac
defibrillators, and the very first priority is to bring a patient within reach of one of these. The first actual medication a patient with suspected thrombosis is likely to be given is a humble tablet of aspirin. Aspirin has a fascinating history. The scientific name for aspirin is acetylsalicylic acid. Acetyl is the name of a chemical group derived from acetic acid - vinegar (fatty acetal). Salicylic acid is derived from the Latin name for willow, Salix. Salicylic acid was originally associated with a possible cure for rheumatic diseases by the old herbalist tradition of signatures: willows grew in damp places, damp places were bad for rheumatism, so willow bark was good for rheumatism. In fact the substance in willow bark is the glycoside, salicin, which is converted to salicylic acid in the body. Another "folk remedy" for rheumatism is oil of wintergreen, whose active ingredient is the ester methyl salicylate. In the 1890s there lived in Germany a Herr Hoffmann, who had rheumatism. He was prescribed sodium salicylate, but it gave him indigestion, his son, who was a chemist working for the German chemical company Bayer, had the idea of acetyllating the salicylate to make it less irritating. He found it worked very well, and had to choose a trade name. He had actually made his aspirin from salicylaldehyde, which had originally been isolated from the meadowsweet. The botanical name for meadowsweet is now *Filipendula ulmaria*, but at the time it was grouped with the Spiraeas as *Spiraea ulmaria* - so that is where the "spir" in aspirin comes from. (I am indebted to Dr Arthur Hollman and his fascinating book *Plants in Cardiology* for this information).

Curiously, it was not until the '60s and '70s that we actually knew how aspirin worked. We now know that it irreversibly inhibits the enzyme cyclo-oxygenase in blood platelets, which produces a chemical called thromboxane A2 which in turn is a message to platelets to stick together to form a blood clot. Even tiny amounts of aspirin have this effect, and half an aspirin tablet every other day is routinely recommended to heart patients. Even more curiously, it is the acetyl- part of aspirin which is crucial, yet so far as I know acetylsalicylic acid does not occur in nature, at least in the plant kingdom! It is possible that minute quantities of aspirin might be produced naturally by the action of bacteria on salicylates. Incidentally, aspirin is the only contribution of the rose family to modern cardiac pharmacology.

The second medication our heart attack patient is likely to receive is morphine, or one of its derivatives. Morphine is a phenanthrene alkaloid derived from the opium poppy, *Papaver somniferum*. This is a native of the western Mediterranean, and it is grown commercially in Asia and Tasmania. Most of the morphine used in the UK comes from Tasmania. The opium poppy grows in the UK as a garden escape, and hybridises with other poppy species. Its efficacy as a narcotic has been known for about 5000 years. Morphine works because its structure quite fortuitously resembles that of naturally occurring substances, of totally different chemical origin, called enkephalins, which act as specialised neurotransmitters in the brain.

By now the patient has reached hospital, and it is time to start treatment which will actually open the blocked coronary artery by dissolving the thrombus. The agent most likely to be used for this is also technically a plant product, though most of us would not necessarily recognise the plant, which is actually a bacterium, *Streptococcus pyogenes* - literally "pus-forming chain of berries". *Strep. pyogenes* has given us scarlet fever, puerperal sepsis and erysipelas. Those who have read Morris West's *Devils Advocate* will remember the hero's walking-companion who died horribly from an infected blister after an idyllic walking holiday: that was *Strep. pyogenes*. It probably did for Rupert Brook, too. Ironically, it is the source of streptokinase, which has now revolutionised the treatment of coronary thrombosis.

Streptokinase "works" by activating one of the proteins in the blood, plasminogen, to become an active clot-destroying enzyme. In using streptokinase to help dissolve blood clots, we are using a substance which probably originally evolved to help the microbe spread more rapidly in the body, and thus contributed to the virulence of the infection. However, in the absence of the streptococcus, streptokinase can be used quite safely.

Another "old" medication now used in quite a different way to treat heart attacks is magnesium sulphate, known to our Victorian parents, and earlier, as Epsom salts. When taken by mouth, it is a fairly mild purgative, but when injected intravenously, in carefully controlled amounts, it has been shown, in studies pioneered in Leicester by Professor David Barnett and Dr Kent Wood to improve survival from heart attacks.

Among the common complications of heart attacks are abnormalities of heart rhythm. Crudely, these can be classified into those where the heart goes too fast, and those where it goes too slowly. One of the arrhythmias in which "the heart goes too fast, and also beats irregularly, is called atrial fibrillation. The standard treatment for atrial fibrillation is a drug called digoxin, which is a representative of a family of drug called digitalic glycosides. The native purple foxglove, *Digitalis purpurea*, produces a glycoside called digoxin, which is actually quite widely used on the continent. Digoxin, which is the commonest form used in Britain, is actually produced from the continental hairy foxglove, *Digitalis lanata*. Digitalis was introduced into modern medical-practice by a Birmingham physician, William Withering, at the end of the eighteenth century. He was stimulated to do so by observing the effects of a foxglove preparation given to one or his patients by a traditional herbalist. Curiously, he did not draw a strong link between the effect of digitalis on heart failure and its effects on heart rhythm. Much of the work relating the effect of digitalis to its efficacy in controlling atrial fibrillation was done by a century later by a Blackburn general practitioner, James Mackenzie, who later became Sir James and the most famous cardiologist of his age.

A slow pulse may be due to "heart block", resulting partly from damage to the heart, and partly from the over-activity of the vagus nerve. This can be treated with a drug called atropine, derived from the deadly nightshade, *Atropa belladonna*. Atropine was one of the three fates who span the web of life (the others were Lachesis and Clotho), and her job was to cut the thread with her shears: presumably a reference to the toxicity of atropine when taken in overdose! The specific name belladonna is said to relate to its use by renaissance Italian beauties to dilate the pupils of their eyes, though since it also prevents the eye from focusing they presumably needed a good look at their potential husband first.

Nowadays, patients with heart attacks are sent home an
average of 7 days after admission to hospital. This is only partly because of pressure on hospital beds, but largely because we now know that early mobilisation does not in fact impair long term recovery. It was not always so: in the nineteen thirties and forties, and even into the early fifties, patients would be kept on strict bedrest for up to six weeks, and when President Eisenhower had a coronary in 1955 it was a month before he was even allowed up in a chair.

The prognosis for patients who reach hospital after a coronary thrombosis is nowadays rather good, but the fact remains that the best treatment for any illness is not to get it. The single most important thing to avoid if you wish to prevent heart attacks is smoking. Tobacco comes from *Nicotiniana tabacum*, and there is still controversy over what exactly in cigarette smoke causes the problems. It seems to be nicotine, which stimulates the sympathetic nervous system, which is responsible for the "lift" of smoking, but the most damage to blood vessels is done by small quantities of hydrogen peroxide which enters the bloodstream from the lungs during smoking. Hydrogen peroxide can damage the thin layer of cells, called the endothelium, which lines blood vessels, and the "leaky" endothelium then lets cholesterol from the bloodstream into the vessel wall. Research in our own laboratory has recently suggested that one of the major defences against hydrogen peroxide is provided by haemoglobin and myoglobin, the red pigments in red blood cells and muscle, provided that there is a sufficient supply of antioxidants in the diet. One of the most important antioxidants is vitamin C, present in fresh vegetables and citrus fruits. Curiously, smokers seem to be more likely to have a dietary deficiency of vitamin C. It has recently been suggested that a regular daily consumption of wine, preferably French and preferably red, also protects against coronary disease, an idea of the suggested components is the red pigment derived from the grape skins.

Cholesterol is often identified as the "villain" in coronary disease, and it is certainly true that a raised plasma cholesterol concentration identifies people at increased risk of heart disease. Cholesterol is however an essential component of living tissues, and is made within the body. In about 1 in 500 people there is a genetic defect in the control of cholesterol concentration, leading to high blood concentrations. In many of the rest of us, high cholesterol concentrations are, to some extent, the result of over-nutrition. Cholesterol is carried in the bloodstream as part of little "packages" of fat and protein called lipoproteins. There are actually two sorts of cholesterol-carrying lipoprotein: High density and low density. It is the low density lipoprotein which is associated with coronary disease, and the high density lipoproteins actually protect against it. Recently, some American investigators studied a group of Mexican Indians who live a very frugal life and have very low cholesterol concentrations. They fed them on a "rich American diet, and noted that their plasma cholesterol concentrations increased. Interestingly, however, both high and low density lipoprotein increased in balance. It is possible that through our constant over-nutrition we have lost the ability to respond appropriately to a rich diet when we meet it.

Apart from total food intake, cholesterol concentrations vary with the balance of different types of fat or oil in the diet. In India, there is a group that rely principally on coconut oil for cooking, but normally eat a lot of fish, and have a low incidence of heart disease. As part of a building contract, many of these people moved away from the sea, continued to use coconut oil, but were unable to get fresh fish. The incidence of heart disease increased dramatically. In this country, we can often see differences in EEC policy affecting our food intake simply by looking at the colour of the fields. Last year many of the bright yellow fields that usually grow oilseed rape were a much more pleasant pale blue, from growing flax. The Latin name for flax is *Linum*, hence linen, but flax is also an important source of unsaturated fatty acids which may help to lower cholesterol. Its specific name of *usitatissimum*, meaning "most useful", may have a specifically pathological content!

Professor David De Bono,  
British Heart Foundation Professor of Cardiology,  
University of Leicester.
THE MEDIA TODAY

Nicholas Herbert
(Baron Hemingford)

The Leicester Mercury Lecture delivered on February 15th 1993

Ladies and Gentlemen, I must begin by saying what a pleasure it is to be in Leicester, not least because it is the headquarters of an interesting new news agency venture, UK News, in which my company and the Leicester Mercury’s parent company are cooperating. I congratulate the Society on its evident good health and, if I may say so, on the advance planning of its programme. It is difficult to resist an invitation to speak 18 months hence; all the usual excuses are unemployable.

I cannot quite remember - it was so long ago - precisely when I accepted the invitation to speak about The Media Today, but I am sure that I must have thought that, by the time we came to February, 1993, all the fuss over the future of the BBC, the dog’s breakfast of the Broadcasting Act 1991, the Calcutt report on the Press and Privacy, Press Freedom, Intrusion, Bugging and so on would have died down. Otherwise, surely I would have demurred. And yet, when I came to marshal my thoughts, I was grateful for the opportunity to make some points which I believe need to be made.

As it is the subject is so huge that I am going to crave your indulgence, or exercise the prerogative of the speaker, to interpret the title of my talk a little more narrowly. I shall confine myself largely to the Press tonight, partly because I know more about that, partly because it is probably more topical just at present and partly because I happen to believe that we are at a very dangerous juncture in the relations between Parliament - particularly the House of Commons - and the Press.

Nevertheless, there are, I believe, huge dangers in the regulation of broadcasting, which are exemplified by the Broadcasting Act. A method of distributing licences which results in one company obtaining a licence for £2,000 while another has to pay £30 or £40 million cannot stand much scrutiny. At a time when technology makes regulation less necessary, why have the politicians increased regulation? Is the attack on the BBC’s licence fee structure politically motivated and did Thames TV’s loss of its licence have anything to do with its upsetting the government with the Death on the Rock Programme? In the era of global television, is it possible, let alone sensible, to try to impose regulation? Is our democracy so unsure of itself that we need to prohibit broadcasters from transmitting the voice of a politician who has been elected to the House of Commons even though he may not have taken his seat and stands on a platform which many find repellent? These are questions each of which might occupy an evening in itself.

I beg leave to say no more than this - it is important to remember that broadcasting is licensed by the Government in this country but newspapers are not. Nevertheless, although I have sometimes observed regulated broadcasting journalists to be marginally less robust in their attitude towards the authorities than are their unregulated newspaper colleagues, we are often in the same boat in the end. Hence the existence of the Association of British Editors, of which I am the Honorary Secretary and which covers editors in both the broadcast and written media. Although I am speaking here tonight under their general banner, the views expressed are entirely personal.

Restrictions brought in to deal with newspapers will, for the most part, affect broadcasters equally and vice versa. The recent decision in the Channel 4 case, for example, which established that under the Prevention of Terrorism Act journalists have no right to protect their sources, means that for any journalist, broadcast or print, issues of legitimate public concern are out of bounds. Much of what I say applies to the Media as a whole, but it is vital to remember that we are on different footings as far as regulation or licensing is concerned.

I have said that the present position vis-a-vis newspapers is dangerous. I shall begin by describing why I think that is so, then go on examine some suggested remedies and attempt to suggest what conclusion we ought to draw. I hope to do this in such time as will allow you the time-honoured opportunity to reply with questions or other responses.

The eighteenth century Irish dramatist Richard Brinsley Sheridan once wrote:

Give them a corrupt House of Lords, give them a venal House of Commons, give them a tyrannical Prince, give them a truckling Court, and let me have but an unfettered Press. I will defy them to encroach a hair’s breadth upon the liberties of England.

These days one might want to shuffle his adjectives around a bit - the House of Commons is more tyrannical than the Prince of Wales and I would hesitate to single out the Lords as corrupt - but I prefer Sheridan’s approach to that of Lord Macaulay, who is credited with the controversial description of the press as the Fourth Estate of the Realm, though he was actually referring only to parliamentary reporters. Anyway, the Fourth Estate of the Realm was never, in my view, a happy description - the Press ought to be much less close to the Establishment than it implies - but in the present state of our constitutional history it looks as though even Macaulay’s wording may have understated the case.

I very much fear that, because of the constitutional imbalance caused by the weakness of the Crown and the House of Lords, the media are in danger of being elevated into something like the Second Estate. Thus, whereas Mr. Justice Potter Stewart, of the U.S. Supreme Court, saw the purpose of a free press as providing a fourth institution outside the government as an additional check on the three official branches, we have a different scenario in present-day Britain. Before you assume that you are listening to a megalomaniac, puffed up with his own and his editorial colleagues’
importance, let me emphasise that I do not, as a journalist, at all relish the idea of the Press as Second Estate of the Realm. Nor, incidentally, as a peer do I expect the House of Lords, as at present organised, to be restored to its former strength. As for the future of the Crown, I leave you to decide what its constitutional fate may be.

Those politicians who are already complaining daily about the overmighty power of press barons and journalists are, not surprisingly most of them in the House of Commons. But the fault, I believe, is in themselves. It is they, after all, who have contrived a situation in which the executive arm of government has become so dominant, that the media are left to do the work of checking and balancing which the Settlement of 1688 prescribed for the Crown and the Lords. It would be encouraging, but I suspect unwise, to regard as a sea change the recent display of strength by backbenchers incensed at the decision to close mines, welcome though that may have been. After all, only yesterday the Sunday papers were reporting that ministers were privately considering ignoring a Commons vote and ratifying the Maastricht Treaty regardless.

However, I must not spend too much time tonight on Britain's constitutional dilemma. Suffice it to remind you that Lord Hailsham has referred to our present arrangements as "an elective dictatorship" and Lord Scarman, who I regard as an even more impeccable witness, says our democracy is not safe because the constitutional insurance embodied in the 1688 system of checks and balances is now grown weak limited and very fragile.

Lord Scarman, as one would expect of so eminent a lawyer, lays much stress on the importance of the courts and the judges, but he concedes that they remain junior partners in the constitution, unable for the most part, to question the constitutionality of any statute.

Robert Kennedy once said that the newspapers were equal, or sometimes ahead, of the courts in protecting the People's fundamental rights. I am ready to genuflect to a great degree before the lawyers, but there are times when the legal system's independence of government may be questioned and judges are no more infallible than the rest of us. They cannot be expected to bear the whole burden of keeping the executive under control.

A vacuum has thus developed, which puts the liberty of the subject at risk because no agency exists to protect him against an over-powerful government, dominant in the House of Commons which itself dictates to the Lords and the Monarchy. It is no accident that freedom of expression in the United Kingdom has been measured - and found wanting more often than not - by the institutions of the European Convention on Human Rights. We have not incorporated into our law, the Convention's various articles, one of which specifically grants to everyone the right to freedom of expression.

Into the vacuum, left by the demise of constitutional checks and balances have stumbled the Media and particularly the newspapers because, after all as I have said, radio and television are under government regulation too.

This is not a situation for which the constitution caters either in its written or its unwritten parts. Nothing exists to guarantee freedom of the press. My rights, if I were an editor, therefore, would be those of the man in the street, which do not, incidentally, include a right to know. So, for example, Mr Justice Rose had to acknowledge recently that he had no power to compel the Ministry of Defence to disclose to the parents the contents of a report on the accidental death of a young soldier. Ironically enough, the only people in the United Kingdom who have a positive, rather than a residual, right to freedom of expression are - you guessed it - Members of Parliament.

I believe it is of the greatest importance that the Press's rights should remain those of the ordinary citizen - unless and until we reform our constitution. If the Press and the citizen do not hang together, we shall assuredly hang separately. We face the danger that the House of Commons, exercising its conclusive power in parliament, will lay down Press rights in legislation which could be amended or strengthened at will by a majority of MPs's voting perhaps in the early hours of a wet Friday. Or, to put it another way, as Bernard Levin did recently: "Would you want a Britain in which the politicians not only run the country but also constitute the last resort of our democracy? If there is no check and balance above the politicians, however constitutionally bound, just stop and think what chicanery, what partiality, what mendacity, what pomposity, what dishonesty, what impudence, greed, folly, crookedness, vainglory, nest-feathering, excuses and plain bloody robbery would be practised on a helpless nation."

It is thoroughly undesirable that the Press should be pitched into being the last resort of our democracy. It is not properly structured for the task and, though it can, I believe, claim some legitimacy as a tribunal of the people, it cannot claim elected status. Moreover, the pattern of its ownership - with most national newspapers being owned by foreigners and many newspapers concentrated under single ownership - gives rise to legitimate concern.

Whether the press will be strong enough to resist the determined onslaught now being mounted in the House of Commons against its freedom remains to be seen. But unless and until we reform our constitution so as to strengthen the constitutional checks and balances and entrench freedom of expression and a free press, we should be very wary of laws aimed explicitly at the Press.

Newspapers, of course, must be subject to the law and, if they decide to break it, must expect, like any citizen, to take the consequences. But it would be unsafe in the extreme to allow politicians to single the press out for special treatment and subject the newspapers to their interference when other checks and balances are so weak.

Left to themselves, it is clear, politicians would love to get the Press under control. In that event the rights of editors would not be worth much. If Ministers, rather than suffer political embarrassment, are prepared to see innocent individuals go to gaol, as in the Matrix Churchill case, they will not hesitate - if they think they can get away with it - to move against a bunch of unpleasant journalists who persist in obstructing their well-laid plans for remaining in power. If we really want such people to be able to control our Newspapers? I do not think so and, indeed, there is no evidence that we do.

I believe people understand instinctively that a Press which is free must, by definition, be free to behave badly - a thought neatly encapsulated by Tom Stoppard in the sentence: "I am with you on a free press, it's just the newspapers I can't stand." But we cannot expect the public to be explicit about
this unless we remind them what is at stake.

It is the job of newspapers to be a nuisance to the powerful. As John Mortimer put it, like playwrights and minor prophets they fulfill their role by thundering denunciations not by sitting comfortably on the front bench with the Establishment. Occasionally they will overstep the mark but it it better that they should do that than never approach the mark at all. Carl Lewis would never have broken the world long-jump record if he had never had a no-jump.

I am not, therefore, suggesting that peace will be restored if we simply enact a Bill of Rights, pass a freedom of Information Act and tidy up the constitution - not that any one of those very necessary actions would be simple. What I am saying is that the relative positions of strength occupied by the press and the members of the House of Commons has hugely sharpened the danger to freedom of speech. Newspapers have not, until very recently, taken the threat seriously or tried to awaken their readers to it.

Reaction to the Prime Minister's decision to sue two magazines for libel has served to underline the point. Simon Hoggart of the Observer noted a week or two ago that, even among Mr. Major's opponents in the Palace of Westminster there was a sense of glee that he was hitting back. That was why the Commons voted by a huge eight-to-one majority in favour of Mr. Clive Soley's so-called Freedom and Responsibility of the Press Bill, which is so unworkable that, despite the anti-press climate at Westminster, it is actually opposed by both front benches, and which is so politically correct that it seeks ways of ensuring that homosexuals and the disabled are represented on a press authority appointed by the Home Secretary.

"Vengeance will now be theirs," Hoggart said. "We can expect laws banning all kinds of intrusion, such as trespass, electronic bugging and long-range lenses. These will certainly protect villains and evildoers as well as innocents, but that is clearly the price that will not have to be paid." He also foresaw a tribunal dishing out compensation to people wronged by newspapers.

I am not so pessimistic - yet. But let us be very clear; the situation IS dangerous.

Politicians like to give the impression that the newspapers are practically free of any restraint, able as one of them put it recently, to pester grieving widows and families, and bombard innocent people with telephone calls, long-distance cameras, and journalists on the doorstep, eager to obtain a story, regardless of other people's feelings. There are some notorious cases of that sort, but things are not always what they seem.

Outrage at Press coverage of the Royal Family's collapsing marriages, for example, looked a little hollow when it was revealed that the parties were using the newspapers to further their respective causes, or that Mr. Joe Ashton, M.P., made not great deal of the plight of a Sun reader who contrived to stick his buttocks together with Superglue. Mr. Ashton toured the seminars lashing himself and others into a fury over the invasion of the poor man's privacy. It turned out that the victim had himself contacted the Sun to give them the story.

Mr Soley, the Labour M.P. for Hammersmith, in the course of extensive lobbying on behalf of his Bill, has solicited complaints from all over the country. He amassed the splendid total of 94 covering an 18 month period, having originally said he would say what they were, reneged on his promise, leaving the impression that may of them were ill-founded or trivial. In any case, 94, from the entire population in a year and a half is not, you may think, very many given the many millions of words published daily in newspapers.

Both the Monarch and the Prime Minister have demonstrated that there are already laws available to those who wish to obtain remedy against newspapers and indeed there is an array of legal restrictions on obtaining or publishing information which curtails the Media. Mr. William Waldegrave's Citizens' Charter department is said to have identified 250 statutes which restrict disclosure of information. Moreover, there has been a growing tendency in recent years for the courts to grant injunctions preventing publication, as in the Sunday Times thalidomide case and the more recent Spycatcher affair, where newspapers were prohibited in advance from passing on to their readers information they had in their possession.

In his famous Commentaries William Blackstone identified the importance for press freedom of no such prior restraint being put upon the press. In other words, to expand slightly on the Duke of Wellington's famous phrase, the Press should be able to publish first and be damned only afterwards.

Restrictions on the freedom of the Press are indeed numerous in Britain, and observers from abroad are often astonished when they come here nurturing their convictions that the British media are some of the freest in the world, to find how much we are hedged around with prohibitions and inhibitions.

I mentioned earlier that there is in Britain no right to know. Harold Evans, a distinguished editor 20 years ago, attributed this to the ethic established by Milton, Locke and Mill, which meant that our philosophy, our law and our attitudes have been conditioned to defend free speech rather than free enquiry. Everything was geared to protecting the right to express opinion rather than the right to obtain facts upon which to base that opinion.

Harold Evans's assessment, made in 1974, was that the British Press was half free. Since then I have detected no progress. Indeed in the Official Secrets Act, the Contempt of Court Act and others, the noose has been tightened in specific ways. Moreover repeated efforts to introduce a Freedom of Information Act founded on Mrs. Thatcher's inapproachable opposition, and her philosophy - in this if not in other matters - seems to have been passed on to her successors.

If the British Press was half free in 1974, it must be less than half free now.

I have suggested one way in which entry into Europe could assist - incorporation of the European Convention on Human Rights into our legislation. However, in other respects the European dimension is a complicating factor. About two years ago I attended in Luxembourg a meeting of 800 employers and employees of the Press. In the workshop on the legal framework it was clear that our colleagues had no understanding of the British press's position. They could hardly believe that we had neither a constitutional protection for freedom of the press nor legislation on freedom of information.

In Europe the practice is to enshrine freedom of the press in
the constitution and, under that umbrella, establish a corpus of laws relating to the press. The whole of that cake might be acceptable here, but I have already explained how unpalatable the second half would be on its own.

Let me take one example. A draft ruling on Data Protection is in preparation in Brussels which will oblige anyone who has information about anyone else to obtain permission before using it. Because this would be an impossible restriction on the Press, the Community proposes to allow national governments to state that it does not apply to the media. In Britain this would be yet one more wedge between the Press and public.

In view of all these inhibitions, domestic and European, it is no wonder, you may think, that newspapers have reacted with such unaccustomed unanimity against the further proposed nails in their coffin. These are Mr. Soley’s Bill and the proposal from Sir David Calcutt that the Press Complaints Commission be put on a statutory basis.

Let me deal briefly with these two matters.

Mr. Soley claims to be concerned with accuracy pure and simple. Unfortunately accuracy is neither pure nor simple. For example, his measure - winningly described as the Freedom and Responsibility of the Press Bill - would estabish a so-called Independent Press Authority, whose 21 members would be appointed by the Home Secretary. He may feel that this process justifies the use of the word "independent". I do not. One man’s accuracy is another man’s distortion. Mr. Soley has conceded to me that a Bill of Rights is required but says he cannot wait until it is in place before pressing his point. So we are invited to subscribe to our own subjugation on the half-promise that one day we may have our rights restored. No thank you! His Bill is widely understood to be unworkable. Indeed both front benches oppose it, yet the backbenchers are giving it a run because of their vengeful attitude towards the tabloids.

As for Calcutt, was it a coincidence that his second appointment - by Mr. David Mellor - came to the day the Minister discovered that his problems were going to be publicised in the Sunday newspapers? Calcutt is, I believe, now widely seen to have been going too far. The Government have said they will need a lot of convincing that a statutory press tribunal would be appropriate. However, they accepted the idea two years ago when Calcutt first proposed to introduce it if the Press did not behave itself, and it is not impossible to imagine an embattled cabinet succumbing to backbench pressure on the point. Nevertheless governmental reservations are very welcome so far as they go.

As David Flint, Chairman of the Australian Press Council, has said, it is incomprehensible that Calcutt should have come to the conclusion he did when revelations about the Princess of Wales’s activities had furnished clear evidence that his central plank was rotten. "A statutory press tribunal, lawyer-driven, would of course become the creature of the rich and powerful", Mr. Flint added.

In his view a number of measures were necessary if the balance was not to be tilted even further against the public interest and in the interests of the rich and powerful. These were

- a general law of privacy, with stiff criteria for ensuring that it did not prevent journalists from going about their proper business,
- genuine libel reform along lines now applicable in the United States,
- generous freedom of information legislation, and
- an entrenched guarantee of freedom of speech.

I am not personally certain that, if the other planks of this excellent platform were in place, it would be necessary to enact a law of privacy. Calcutt regardless to say recommends it, though without the balancing safeguards. But sufficient remedies may already be available in the laws of trespass, confidentiality and libel, with the important proviso that the latter could be made financially accessible to everyone by putting it into the legal aid scheme.

I believe, contrary to Calcutt, that the Press Complaints Commission has succeeded in persuading the few recalcitrant editors to behave better. The code of conduct which it administers was drawn up by editors and has recently been strengthened in respect of telephone tapping and bugging. There is, it seems, real possibility that the Commission will accept a majority of lay members.

Notwithstanding the fact that, by all accounts, the editors are harder on their colleagues than the lay members are, it is a beguiling argument that journalists should not be judge and jury in their own court. Provided that some means could be found to ensure that lay members started from the point of believing in a free press, a majority of lay voices might be acceptable, but that proviso in itself might fail to appease the Commission’s political critics.

The Commission is funded by an organisation with the uncomfortable name of Pressbaf, which was set up with what I regard as indecent haste in response to Calcutt Mark I by the newspaper industry’s trade associations, the Newspaper Society and the Newspaper Publishers Association. For my part I have always wished that they had been a little less keen to dance to the government’s tune, a prejudice which was reinforced recently when I read an account of an interview between Lord Camrose and Adolf Hitler in 1936. Hitler said that the time had not come for a free press in Germany. The English did not realise how important it could be to promote Bolshevism in the past and the same would happen again if the newspaper were to say what they liked. French workers had recently won concessions which Germany could not afford to pay its workers. What would have happened if the German press had been allowed to taunt the German government?

The trouble in Germany had been largely created by the lies printed in the press, As it was, there was no active Government censorship in Germany; the control was exercised by the newspapers themselves through their own Trade Chambers.

That is a pointed reminder that the line between self-regulation and self-censorship is a narrow one, which is one reason why the first Calcutt report was so dangerous. It established a kind of permanent sword of Damocles over the press, which could be invoked at will by the lawmakers. Calcutt’s own expectations were just that; he says in his second report that the threat of statutory regulation should have been enough to bring the press into line. He now believes that it has not done so and that statutory regulation should be imposed.

Of course, some newspapers are crassly insensitive in their
coverage of individuals, be they public figures or private citizens. A typical complaint was made recently by Frank Bough, the TV personality, who was publicised in the tabloid press for a scandalous private life. Bough complained of surveillance and entrapment in that telephone conversations were taped and subterfuge was used to get his photograph. He claimed the editor who decided to publish the story told him that her staff had worked so hard on it she could not let them down by refusing to publish it - not, if true, a convincing reason.

Mr. Bough's comment on the episode was illuminating. He said:

I think the idea of a shackled press is a nonsense. I don't want it, nobody wants it. But the sad fact is, some papers seem determined to foist it, come hell or high water, on to the rest of us, and I think that is regrettable.

It's what I call the entertainment side of the business. Lots of good papers, including the tabloids, do terrific jobs on political and social comment, serious debate on the affairs of the country. But it was a proprietor.... who said "We are of course a branch of the entertainment industry" and it is that side of the industry which is being abused and where intrusion into privacy is prevalent.

Mr. Bough, while admitting that he had behaved badly, spoke emotionally of his own and his family's distress and added that he hoped one day to be able to resume his life and get on with his career. He was applauded by his audience - piquantly composed of journalists.

A number of important points emerge from his comments.

First, there is the question of whether society is going to allow itself to have a shackled press foist upon it by a few newspapers. Or, if I may rephrase the question more pointedly, whether society is going to allow politicians, using the excuse of bad behaviour by a few newspapers, to shackle our press. Inconveniently for the politicians, of course, the papers of which they complain most loudly are among the most popular with the reading public. Moreover, most of the clamour from politicians is made in the name of protecting the "little man, the private citizen" but almost all the alleged horror stories concern treatment of the rich, famous and publicity-conscious. That was strikingly the case when two of my colleagues from the Association of Editors appeared before the National Heritage Committee in Westminster recently to give evidence on these matters.

Secondly, is it possible to devise a method of preventing private individuals being subjected to what he calls the "entertainment" type of intrusion, while permitting the intrusion which may be necessary to unmask a bent double-glassing company or a corrupt policeman or a Chinese triad? To catch that sort of crook, surveillance, intrusion, even bugging telephones, is necessary and you may not know, when you embark on an investigation, what you are dealing with.

Thirdly, Frank Bough is a public figure, who has lived by the media. Public figures must expect intensive coverage, but can private figures be defined and protected as some would like?

These are the kind of questions which, though not posed quite so directly, lie at the heart of the current debate on the Calcutt Reports and the Soley Bill.

My belief is as follows:

First, it would be madness to sacrifice the freedom of the Press for the sake of obtaining revenge on a few badly behaved newspapers. Mr. Flint is right when he says that some of the proposed reforms would favour the rich and powerful. Many ordinary citizens actually prefer their press to be robust, cheeky and lacking in deference. Aside from what looks like the middle class thinking it knows best what is good for the lower orders, the fact is that a genuinely free press must be free to be bad as well as good. That does not excuse the lamentable treatment sometimes meted out to rape victims or other private individuals whose affairs have become public and for whom some better means of access to legal remedy should be found. But, as Bernard Levin put it, free speech is for swine and liars as well as upright and honest.

So the price of a free press is some bad newspapers. Without condoning the badness, I think it is a price we should be ready to go on paying as we have done in the past, recognising that the Press Complaints Commission, which is still evolving, does command respect within the industry as a self-regulatory body, and that, as in the case of the Sun's coverage of the Hillsborough disaster, the readers do have ways of showing their disapproval. The paper's circulation in Liverpool has never recovered from the aspersions it cast on Liverpool fans.

A related point was well made by my friend Gerald Priestland, the BBC's late religious affairs correspondent, who said "Journalists belong in the gutter because that is where the ruling classes throw their guilty secrets."

Secondly, distinguishing between entertainment issues and serious matters - although both politicians and editors sometimes, for their own reasons, suggest otherwise, "the public interest" and "what interests the public", are clearly two different things. Anyone in this room could describe the difference easily.

Finally, upon inspection it will be found very difficult to distinguish "public figures" from "private persons". It all depends who you are and in what newspaper you are being reported. To the News of the World, for example, the Vicar of Little Midwallop is not a public figure. But to the Little Midwallop Clarion he most certainly is.

Ladies and Gentlemen, it is an old saw that hard cases make bad law. Where is a real danger that an incompetent and beleaguered Government will seek to placate the backbenches which are up in arms about some recent hard cases. These have for the most part concerned public figures, whose activities ought to be subject to close scrutiny. The legislators claim that they are interested only in protecting the private citizen, but most of their specific complaints have been about people in the public eye and all the cures they have suggested have been a good deal worse than the disease.

Nicholas Herbert.
The Old Rectory,
Hemingford Abbots,
Huntingdon,
Cambridgeshire. PE18 9AN.
COMMERCIAL EXPLOITATION OF OUR FOSSIL RESERVES

Stan Wood

Summary of a lecture delivered on March 1st, 1993

If exploitation be the successful application of industry on land by mining or quarrying then their are five or six major players in the fossil industry currently operating in the U.K. field employing full time staff. There are many more smaller concerns operating without the use of heavy plant in the field usually working locally. Most of the material collected is sold through shops owned by the firms concerned to the general public. Exceptional fossils are usually offered to institutions initially, at a commercial price.

A personal survey of current U.K. dealers estimates an annual approximate turnover of £250-£300,000 with considerable additions from time to time accrued from certain outstanding fossils sold to research institutions and other outlets. Retail outlets exclusively selling fossils and minerals are now widespread from Sutherland to Dorset.

Circa fifty new species have been retrieved by commercial and amateur fossil hunters during the past two decades. This achievement is missing from the arguments of the anti-commercialists. Quite how this mini-age of enlightenment has escaped the latter is bewildering given that these discoveries add tremendous stimulus to palaeontology. The new data induces reviews of systematics and certainly provides sound endorsement to research funding claims at department level.

Vociferous opposition to the rise in commercialism over the past decade is periodically expressed in media articles and letters from lay and academic folk in equal measures. In specific instances where reckless profiteering is involved this criticism is fully justified. If aimed however at my own firm, "Mr Wood's Fossils" exclusively quarrying in Scotland, and other reputable concerns diligently producing excellently prepared fossils from Jurassic rocks in England, the criticism is unjustified. Criticism in principle to commercialism is held by some, perhaps many, but this surely ignores the fact that a market in fossils has been well established for nigh on 200 years and furthermore is expanding despite the current world depression.

Commercial enterprise provided the complete dinosaur purchased by Ulster Museum, a specimen which has doubled the museum visitor figures since going on display. Bristol Museum's sea dragon exhibition succeeded on the back of purchases made from the commercial sector, again indicating the public drawing power the trade can provide. On the investment side, the Natural History Museum's purchase last century of a fossil bird from a quarry in Germany is now reputed by the owners to be worth several million pounds. Further benefits to society by commercial fossil hunters are the numerous PhD projects successfully completed based on material purchased for that purpose.

Commercial exploitation is alive mainly through entrepreneurial skills creating new markets, but above all because there is a public and academic demand for the product. Responsible firms working within the law attract responsible clients and strive to retain them. They are well established by reputation and hold legal title to the products they sell: to do otherwise would be to entertain commercial suicide.

We are rich in oil, rich in coal, and extremely rich in fossils. We exploit the oil, protest nationwide when coal exploitation is curtailed and yet are apprehensive at fossiliferous rock extraction. The 230,000 square kilometres of the U.K. encompasses fossiliferous rock from thirteen geological periods holding huge reserves which will never be exhausted. There is an exciting prospect ahead for centuries to come in the countless new species awaiting the arrival of the hunter.

The fossil entrepreneur evokes creativity, increases interest in natural history, fascinates children, creates businesses, employs, exports and entertains, all in a day's work!

Stan Wood.
5 Cowgatehead,
Grassmarket,
Edinburgh. EH1 1JY.
THE LONDONDERRY PLANTATION 1609-1914

by James Stevens Curl

Lecture delivered on February 1st 1993

It is one of the great paradoxes of history that English intervention in Ireland was approved by the Papal Bull Laudabiliter in 1155. Armed with this essential Imprimatur King Henry II was granted the Lordship of Ireland, and an Anglo-Norman force invaded that Country. The motives were not hard to find: the Irish Church was irregular by European and English standards, and the authorities in Rome wished to use the power of Norman arms to bring Irish ecclesiastical matters firmly under central control. The Anglo-Normans may not have been great Christians, but they were reliable Churchmen.

Irish society at that time was organised on Clan lines, with Chieftains who not only were patrons of the Church and builders of Abbeys, but who could rise to Kingship through force of arms or moral authority. It must be emphasised that even Kingship was not associated with ownership of land, and that Gaelic society was quite different from anything in England or in Continental Europe.

Although the Norman Conquest of England was a thorough and consolidated affair, it is important to grasp the fact that the Anglo-Norman Conquest of Ireland was not. In fact English authority was largely confined to the Pale of the east coast, and acted like a 'running sore, constantly irritating the Gaelic regions beyond the Pale, and deepening the confusion' as Sir Henry Maine noted.

The Anglo-Normans invaded north-eastern Ulster in 1177, and a series of Norman strongholds was established, with several great Abbeys and other foundations. The rights of the English Crown in Irish episcopal elections were recognised in 1219, but English power suffered a number of disasters in the fourteenth century, and by 1430 the only parts of Ulster still subject to English law were confined to Down and a few places on the coast, although an English presence seems to have continued in the Coleraine area. By the second half of the fifteenth century all Ulster, except for a handful of places on the shores, was in Irish hands once more.

With the consolidation of the Tudor Monarchy after the Wars of the Roses, English statesmen once more turned their attention to Ireland, and it was decided to bring English law and custom to an island torn by Clan warfare and by the growing ambition of Gaelic Chieftains. English power was imposed on Ireland through an executive in Dublin, but even then large tracts of the Country remained outside the rule of English law, and Ulster was the most Gaelic, most remote, and most independent part of the whole island. Partly because of the natural barriers of mountains, bogs, and rivers, and partly because the remoteness of the region, it did not attract too much attention by would-be law-makers or settlers.

All that changed with Henry VIII. Not only did he break with Rome, but he changed the Lordship into a Kingdom. Now, Irish Provinces, especially Ulster, were devoted to the old religion, and, as a heretic, the new King could not command the allegiance of the Irish Chieftains. Attempts to convert the island to Protestantism met with only limited success, partly because Anglican clergymen would not learn Irish, and partly because the authority of the Chiefs was still a force to be reckoned with. To make matters worse, English policy in Ireland was manifested in a series of responses to crises, rather than in an coherent and consistent way (a tendency that is even more pronounced today). Confused and spasmodic actions did not fool anyone: the Irish had no confidence in the new system and no sense of loyalty to the Monarch.

In order to control the Country a policy of Surrender and Regrant was introduced whereby the lands used by the Clans were 'surrendered' to the Crown and regranted to the Chieftains who were created tenants-in-chief under the Crown, and became ennobled as Peers of the Realm. In this way the people were deprived of their common heritage, and ownership passed to a few nobles who were obliged to swear allegiance to Henry as King of Ireland. By 1543 many Irish Chiefs had submitted to the Crown, had visited England, and had accepted Earldoms and other titles, so they held their lands and titles subject to allegiance. It was an uneasy business.

Aggressive attempts to Protestantise Ireland under Edward VI had some success, but the mass of the populace remained firmly Catholic, while under Mary Tudor the Bull Hiberniae of Pope Paul IV affirmed the Papal authority in the matter of the governance of Ireland by recognising that Country as a Kingdom and granting sovereignty to Philip and Mary. Legitimacy was thus conferred on the English Kingship of Ireland. Even under those most Catholic of monarchs a project of colourisation of Ireland was pursued. Clearly, Ireland was to be Anglicised whether England had a Roman Catholic or a Protestant on the Throne.

The accession of Elizabeth brought matters to a head. Mary Queen of Scots was recognised as Monarch of England and Ireland by France, and Elizabeth was seen by the great Catholic powers as the illegitimate offspring of an adulterous liaison. Philip of Spain delegated any claims to the Kingship of Ireland to Mary Queen of Scots, and in 1570 Pius V issued the Bull Regnans in Excelsis which excommunicated Queen Elizabeth and freed all her subjects from allegiance. Throughout the next decades Papal intervention in Ireland was usual, and Spanish troops actually landed in Ireland in 1580.

English administration by then was effecting a great change in the tenure of land, and Irish social structure was further undermined after years of inter-tribal warfare. International events played their parts in inflaming affairs in Ireland as Gaelic culture drew to its end. In 1587 Mary Stuart was beheaded but her Will nominated King Philip of Spain as her successor to the Three Kingdoms. The King delegated his
claims to the Thrones to the Infanta Isabella, and it was in her name that the Spanish Armada sailed in 1588. This great venture was not only the King’s attempt to use force to gain what seemed to be rightfully his: it was also part of a Counter-Reformation crusade against heresy and illegality. Many Irish emigrés were on board the ill-fated fleet.

And what of Ulster, that most remote and Gaelic part of Ireland at that time? The O’Neill’s had risen to supremacy in the lands west of the Bann, and had been created Earls of Tyrone, yet the Chieftains, through sentiment and religion, were tied to Spain and to the Catholic powers. The O’Donnell was created Earl of Tyrconnell, and attempts were made to shire Ulster by the English. Historically there were two great Counties, Antrim (where the Macdonnells and the O’Neills were paramount), and Down. Now new Counties were created out of the rest of Ulster: these were Coleraine, Tyrone, Armagh, Donegal, Fermanagh, and Monaghan. County Cavan was detached from Connacht and added to Ulster early in the seventeenth century.

Various seizures of land by the Government alarmed the Irish nobles, who demonstrated their solidarity with the Papacy and with the Continental powers by embracing the Gregorian Calendar in 1582. Sundry enactments to consolidate English power and to remove Catholic Priests from the land created further problems for a Country that had been troubled with endemic revolt. In Ulster there were few settlements, difficult terrain, and a hostile population. Thus it was that when the remnants of the Armada were bated to pieces on the Irish coasts, many Spaniards were given refuge by the Gaelic Chieftains who were now nobles owing allegiance to the heretical Queen. Suspicion as to the loyalty of the Ulster Earls grew further when news reached London that Hugh O’Neill, Earl of Tyrone, had been inaugurated as ‘The O’Neill at Tullahogue in 1593, a title he himself had renounced, and which was, in any case, illegal. Spanish gold began to circulate, and two alien cultures moved towards war. Plans were laid in 1594, and very soon one of the mightiest attacks on English power was launched under the leadership of Hugh O’Neill, now The O’Neill, and King of Ulster, with his allies the O’Donnells and Maguieres, and, most importantly, the King of Spain (to whom O’Neill and O’Donnell had written letters swearing allegiance). For the next eight years Elizabeth’s most able generals were engaged in a bloody war that almost spoiled the end of Protestantism. The Ulster nobles had risen in ‘God’s just cause’ as an attempt to retain lands and to re-establish Irish power, but it was also a Counter-Reformation crusade to protect the Catholic religion and the structure of Gaelic Ireland against Protestant heresy and English organisation. The armies of Ulster were astonishingly successful, winning victory after victory over Elizabeth’s crack troops. This ‘unthrifty and inauspicious war’ clouded the last years of the Queen’s life, as the ‘King of Spain turned the tricke upon her’, by cherishing the Irish Rebellion, as Naunton put it. In 1601 a Spanish fleet landed a large force in the south, which was strategically foolish, for the Ulster nobles had to march south to join up with their allies. Mountjoy and the English forces were ready, and in 1602 articles of surrender were signed, the Ulstermen having been defeated and forced to retire to the fastnesses of Tyrone. The English marched on Ulster, fortified Derry, and smashed the inauguration throne of the O’Neills at Tullahogue. O’Donnell and O’Neill submitted to the new King, James I and VI, in 1603, received pardon, and had their lands restored to them with their English titles.

With that Submission, Gaelic Ulster was thoroughly reorganised and lands were regranted to the Irish nobles. From 1605 the territories were shired and surveyed and, ominously, state lawyers began to discover errors in the patents and grants of land. Protestant Bishops were established in the Sees, and religious conformity was required. Many of the O’Neill vassals, such as the O’Cahans, were created landowners in their own right and given Knighthoods, thus causing their former overlords to rage and argue, in spite of their status as nobles. The fact of the matter was that to hold land as an Earl under the Crown was incompatible with the rights and grandeurs of an Irish Chieftain, and the strain told. Gaelic social order was doomed.

English garrisons were then established in Ulster, justices and sheriffs were appointed, and the King’s law-officers made their circuits. However, the old Gaelic notions of allegiance to a Chief created incredible stresses and arguments about the ownership of land, and a first-class row developed between the O’Cahan (who had been knighted) and his former Chief (The O’Neill; now Earl of Tyrone) over the ownership of land. The vociferous Ulstermen were summoned to London.

Then something quite extraordinary occurred: a ship put into Lough Swilly in September 1607, and the Earls of Tyrone and Tyrconnell, with about one hundred retainers and members of their families, fled to the Continent, an event that was known as the Flight of the Earls. Bills of Indictment were brought in, and the Earls and their associates were charged with High Treason. Their lands were declared forfeit to the Crown.

In 1608 the young Lord of Inishowen was insulted by the Governor of Derry, and within a few days had sacked the town, burnt everything down, and butchered the garrison. Later Sir Cahir O’Doherty was killed at Kilmacrenan, and his lands became escheat to the Crown.

A survey of 1608 found that nearly all the lands of Coleraine, Tyrone, Fermanagh, Armagh, Cavan, and Donegal (both temporal and ecclesiastical) were escheat to the Crown, and the death of O’Doherty added Inishowen to Donegal.

O’Cahan was indicted in 1609, transferred to the Tower of London, and never seen again. So it was with Niall Garve O’Donnell, Cormac O’Neill, and even the son of the Earl of Tyrone, who was at Eton. Thus did the Lord Deputy remove all the Irish landowners from their ancestral Countries, making huge tracts of territory available for colonisation. O’Neill was to die in Rome, where he was buried as Prince of Ulster before the altar of San Pietro in Montorito.

Ulster was now free of all encumbrances to colonise it, and its seven new Counties were to be planted with settlers from Great Britain who had to be loyal to the Crown, who had to take an oath of allegiance, who had to adhere to the Established Church, and who had to do all things in order to hold their lands. These settlers were called Undertakers, and they were obliged to build castles, bawns (walled enclosures for defence), and villages.

A very large tract of Ulster had been O’Cahan’s Country in County Coleraine, and no Undertaker would touch it because O’Cahan was languishing in the Tower, and any title to his lands was suspect. The King then turned to the City of
London to raise cash to plant, or colonise, the area. Soon it became apparent that the King meant business, for the City issued a precept to each of its Livery Companies demanding cash for the Plantation of Ulster. Liverymen suddenly found the attractions of Country life could not be resisted, and disappeared out of town as fast as their legs would carry them. Prudent merchants were not going to pour money into distant, Gaelic, barbarous, Papist Ulster. Gaol, confiscation, and fines were used to extract the money.

Then the blow fell. Not only was the King determined to raise the cash, but he had no further resources to persuade his reluctant subjects to colonise Ulster. He therefore determined that the City of London should colonise O’Cahan’s Country itself. After much coercion, threats, and chicanery, it was agreed that the City would colonise a much larger area than O’Cahan’s Country. This was to be called the County of Londonderry, and consisted of the old County of Coleraine to which parts of Counties Antrim, Donegal, and Tyrone were added in order to consolidate both banks of the Rivers Foyle and Bann, and to provide the Londoners with the building materials of the great forests of Glenconneley and Killetter. The two huge rivers, both navigable, and both teeming with salmon, were additional attractions. In addition, the King established the Most Noble Order of Baronets to pay for the colonization, which is why Baronets have the Red Hand of Ulster as parts of their escutcheons.

For its part, having been granted this new county, the Londoners were to build a walled city, a fortified town, and several smaller towns and villages, all to a proper standard, and all with castles and bawns. Houses were also specified to be of the English type and to act as exemplars for future housing policy. The County was divided into twelve lots, or Proportions, each of which was to be colonised and developed by one of the twelve Great Livery Companies, acting alone or with its Associate Companies. Those areas not allotted to the Companies were to be granted to native Irish gentlemen and to the Anglican Church. Irish natives were to remove themselves from the Company lands and were to settle on the freeholds or on Church lands, or on the lands of Servitors, who were retired soldiers granted territory and capable of keeping the natives in order.

To administer the Plantation of Londonderry a new body was set up called The Society of the Governor and Assistants, London, of the New Plantation in Ulster, known later as The Honourable The Irish Society. It was effectively a development corporation, but its powers were enormous. ‘And they, the successors of high renowned Lud, will there reedifie a new Troy. Their spatiuous coffers have the receipts of England’s treasure. They have O’Cane’s Country, and whatever Ireland’s Eden can afford … Therefore let Coleraine rejoice, for the heart of England (London herselfe) will no doubt make her more beautifull then many …’, so wrote Thomas Blennerhasset, an enthusiast for the Plantation. £60,000 (an enormous sum) was levied on the Companies, and each Great Company was allotted an Estate that on paper seemed quite manageable. However, 40,000 Plantation was about 360,000 acres in fact, an anomaly that is accounted for by the differences within Irish and English methods of measurement and by the perfunctory nature of the original land surveys. It must have been astonishing for the Londoners to arrive in Ulster and find that their Estates were so huge. And what lands! The immense tracts of fertile Country, once the domain of the O’Cahans, with the wide expanses of Lough Foyle and the long peninsula of incomparable Inishowen; the great River Bann, alive with fish, and the coastline leading eastward to the cliffs of Antrim; the long view over the Atlantic to Islay and the Paps of Jura; the massive hill of Binnevenagh standing sentinel over the lands of the Haberdashers and Fishmongers; the Salters’ capital at Magherafelt; the splendid natural harbour of Derry; the noble River Foyle; and the great sweeps of the southern part of the new County seen from Slieve Gullion looking down on the Draper’s Capital of Moneymore and the expanses of fertile farmland stretching to Lough Neagh with the Antrim hills beyond. It must be one of the loveliest landscapes on earth.

One of the first tasks the Londoners had to face was to carry out a survey. In 1600 Derry was fortified, but there was little sense of structure in the building layout. All the Company lands had to be surveyed: a dangerous task as the natives were not exactly friendly. Some Companies were luckier than others for they drew Proportions near the sea and near the protective fortifications of Derry and Coleraine, but others, like the Drapers and Skinners, held land-locked fragmented Proportions in country that was infested with the Wood-Kerne, or Irish Guerrillas.

It must have been extraordinary to hear English voices in the clearings of the vast woods as English houses rose in a land that would have seemed remote and menacing. Fortresses were built, like that at Culmore, to protect the settlements, and the new City of Londonderry, with its massive walls, was begun. Coleraine was also laid out although it was constructed of timber-framed buildings, while Londonderry was made of stone. Coleraine was protected by an earthen rampart and a wooden stockade: it acquired its Parish church and a number of fairly humble houses. The men who directed operations as agents of The Irish Society, Rowley and Beresford, were later commemorated by funerary monuments in the Parish church.

While the building of Londonderry’s walls and the arming of the city by the Companies were immense undertakings, the erection of the great Cathedral of St Columb by London reasons was of tremendous symbolic importance. A distinguished work of Gothic Survival, dating from 1633, it looked back quite deliberately to traditional church design. The nave arcades are fine work: ‘If stones could speake then London’s Praye Should Sounde, who built this Church and citte from the Ground’. Here then, was an immense achievement in a very short time: by the third decade of the seventeenth century the Londoners had built a walled city, with its Cathedral, a regularly planned fortified town, and many villages, castles, and towns inland.

Let us look at some of the Company settlements, as surveyed by Thomas Raven in 1622. First, the Mercers’ Estate. On the left is the River Bann with the settlement at Movagheer, while at the top is an old Irish fort with some houses. Churches are also shown. A detail of Movagheer shows the castle, bawn, and flankers, with four timber-framed houses (with central stacks) and other structures of a less ambitious type. On the right is the Bann, with a mill. Note the thick forest. The Grocers had their Estate on lush lands by Lough Foyle, and established their capital at Muff, which was renamed Eglington in the nineteenth century. The village building-history is well documented: there was a castle and
a bawn, a church, and a few houses, including one very sizeable structure.

The Drapers’ Company Estate was fragmented and landlocked, bounded to the south by the Skinners’ Proportion and part of County Tyrone (the O’Neill fastness). How such a Proportion could be thought to be defensible is unclear, but the theory was that the Londones would surround the Irish: in practice, there were very few Londones at all. The Drapers’ capital of Moneymore shows the castle and bawn lying in part uncovered, with the timber rotting, and shows the castle and bawn is decaying, and in no state to be defended. Note the flanks, one of which was the chapel. Note also the timber-framed houses, all with central stacks, and the stone-built houses. Irish cabins paid scant respect to any attempt at formal planning around the cross and stocks. More seriously the freeholders numbered one, while British on the Proportion were only 16, and meanly armed against 186 natives, all armed to the teeth. Work on building had to take place with a gun in one hand and a hammer in the other. Roofs were generally shingled on the Drapers’ Estates, and chimneys were of brick or of freestone. Interestingly, the plan of the castle of 1617, as it was at the time it was built, survives, and shows the flanks, gatehouse, chapel, chimney-stack dividing the kitchen from the hall, and other details. As interesting is a plan of a house on the Drapers’ Estate, drawn in sepia ink and signed by Antony Lipsett, 1615. The larder, buttery, and kitchen are to one side of the hall, and have a separate entrance. The stair divides the hall from the parlour. Substantial rooms were disposed upstairs, and the windows are of the mullioned type. Typical plans for houses show central stacks, and the door opened to the side of the stack. Bread-ovens were provided, and dimensions are shown. The records show the names of the contractors, carpenters, and so on and prove that everything, even the humblest of housing, was carefully planned.

The Fishmongers were more fortunate. Their Proportion was on the southern shore of Lough Foyle, although it did include some hilly ground, mapped with suitable vagueness by Raven, who clearly did not wish to get his throat cut by venturing into the bogs and mountains where the ferocious Kerne lurked, ever watchful. At Ballykelly the Fishmongers built New Walworth, a village with a castle, bawn with flanks, a church, and several houses, some of which were timber-framed. The chancel-arch of the church survives today.

The Goldsmiths owned the Estate opposite Londonderry, on the south bank of the River Foyle, and erected their capital at New Buildings, with castle, bawn, flanks, and houses which were of stone. If the Goldsmiths were fortunate in their Estate, the Skinners were very unlucky, for not only were their lands poor, enormous in extent, landlocked and mountainous, but they were in the south, on the borders of Tyrone. They had to build two castles and bawns. One of these was at Brackfield or Crossall, and consisted of a bawn with two flanks, a modest house and a few poor cabins. The ruins of the castle survive. The Skinners’ second castle was at Dungiven where Raven drew a fascinating picture. For a long time it has been assumed by commentators that the ‘bawn’ at Dungiven was the wall behind the so-called Dungiven Castle, which is an early nineteenth-century building. Even the most cursory examination of this wall convinced me that it was not the Planters’ bawn, and indeed the plan shows that it was not. A closer examination of Raven’s drawing raises some interesting points. First there is a river running beside the site. The so-called castle has no such river. Secondly, Raven’s drawing shows what appears to be a mediaeval tower-house, with a nave and chancel stuck on it. To the left is an obvious seventeenth-century house, bawn, and gate, and a Jacobean formal garden lying to the west. The site that fits this is the ruin of the Augustinian Priory which contains in its chancel the celebrated flambayont tomb of one of the O’Cahan Chieftains, with galloglasses as weepers. An eighteenth-century engraving of Dungiven Priory clearly shows the nave, chancel, and ruins of a tower-house at the west end. This tower-house was the residence of the O’Cahan Chieftain to which the English added a more convenient house, and the entire ensemble was quite obviously the Skinners’ bawn. Matters were clinched for me when I found a plan of Dungiven dated 1792 which shows the outline of a castle that bears no resemblance to the Planters’ bawn, and there is no bawn wall at all. The ‘castle’, so-called, is in fact an eighteenth-century pile, reworked in the 1830s, and never, in truth, finished. Furthermore, the Civil Survey of 1654-6 states that the castle and Abbey stood with a water mill at Strangmore, outside Dungiven, and so the site of the Planters’ bawn was quite definitely at the Priory.

The Clothworkers were more fortunate than the Skinners: they were allotted a Proportion on the west bank of the Bann opposite Coleraine. From the first they were associated with the Merchant Taylors. Simon Raven made a detail of the Merchant Taylors’ capital at Macosquin in 1616 which shows the castle, bawn, church, and houses. In 1622 Raven surveyed the entire Merchant Taylors’ Proportion, which was landlocked but which had the River Macosquin running through it, and one side bounded by the River Bann. Raven’s detail of Macosquin is interesting because it shows an unusual castle with bartizans, dormers behind a parapet, and canted bays. The bawn is unfinished, and there were a mill, a few houses, and a church (which was actually a fragment of the old Irish Cistercian Abbey of the Virgin of the Clear Spring). A layout plan of Macosquin of 1615 survives which shows the village, church lying at the same angle to the main street as it does today, and castle with Jacobean gardens within the bawn. Building accounts survive as well, with the names of contractors, all of which is fully described in my book, so it would be inappropriate to go through the lists here. The church, now the Anglican Parish church, has mediaeval remains embedded in its north wall.

The Haberdashers had a Proportion that adjoined the sea opposite Inishowen, in spectacularly lovely Country, and established their capital at Ballycastle, an Irish name that suggests there had already been a fortification on the site, and indeed that was so, for the Anglo-Normans had built a stronghold there, the ruins of which provided a quarry for Sir Robert McClelland, the first Chief Tenant of the Haberdashers, to build his castle and bawn. The Haberdashers’ village at Artickelly (about a mile from Ballycastle), had no architectural pretensions, and seems to have consisted of a street of single-storey cottages, with back gardens, as would be expected from a body of men brought over from his native Kirkcudbright by Sir Robert.

The Salters obtained a Proportion that was well wooded, and which lay by the shores of Lough Neagh, then Lough Chichester (after the Lord Deputy). Two towns were established, each with a castle and bawn, at Salterstown by
the Lough shore, and at Magherafelt. Raven showed both settlements in his survey of 1622, but although Salterstown was virtually complete then, Magherafelt was unfinished. The castle was rotting and decaying, and was used as a pound for cattle. It had no roof. Two castles were necessary in this dangerous part of the County that was infested with bandits. Houses were timber-framed, and roofs were of oak shingles. The ruins of Salterstown castle are impressive, even today.

With the Ironmongers we are again fortunate, for records survive, written by George Canning, Agent of the Company, and ancestor of the Barons Garvagh and the politician Canning. It was a fragmented Proportion, broken up by Church lands, and bounded on one side by the Bann. It was dangerous too, and William Brock provided a design for a fortress that was unfortunately not realised. The capital of Agivey stood by the River Aghadowey, with a timber stockade along the riverside, and there was a scattering of houses in the Agivey Culcrow area. A map of 1854 showing the Estate indicates just how fragmented it was, and ultimately undefendable.

The Vintners were also granted land in the dangerous woods to the south, by the shores of Loughs Beg and Neagh. Woods, of course, were valuable for building, but, in spite of legal documents and signed agreements, the agents of the City began denuding these great forests for profit, in order to make pipe-staves, and to export timber, contrary to the King’s wishes. There was another factor too in that the removal of the woods also destroyed useful cover for the Wood-Kerne. At Vintnerstown, or Bellaghy, the Vintners built a great castle with bawn, a new church, and a village of houses that were partly timber-framed and partly of stone or brick. The flankers of the castle survive to this day.

As has been mentioned, the Clothworkers had a Proportion bounded by the sea and by the Bann, and established their capital at Killowen, on the site of an Irish castle opposite Coleraine. Another revelation of the 1616 Raven map shows the arrangement more clearly. Killowen castle was unusual in that it had a bawn wall that was loosely thrown around the castle indicating an earlier origin, while the village of Articlave, some two miles away to the west, consisted of a huddle of single-storey cabins. Killowen in relation to Coleraine was shown in 1622 by Raven, who indicates the earthen ramparts of the town, the regular layout, and the fact that Coleraine was anything but complete. The riverside was undefended, and Raven proposed a wall with flankers and a gate approached from a bridge.

Finally there were the lands of Sir Thomas Phillips, who had been a soldier, and who had been granted lands at Coleraine and Toome. In fact, he had started to build Coleraine, and had sunk a great deal of capital into the venture when the Londoners became involved. Phillips’s lands were taken by the Londoners, and Phillips was granted O’Cahan’s heartland on the River Roe between Ballycastle on the Haberdashers’ Estates, the Fishmongers’ lands to the west, and the Skinners’ lands to the south. Sir Thomas’s new capital at Limavady was a model of order compared with some of the Londoners’ efforts, and by all accounts was extremely well-built. He took over the old O’Cahan fortress at the Dog Leap on the Roe as his own residence: there, in that magical spot, where Lady O’Cahan had mourned the loss of her husband with many an ochein, Sir Thomas laid out formal Jacobean gardens, dovecotes, paddocks, herb gardens, and the like. It was he who began a campaign of unremitting antagonism for the City with his devastating survey of conditions in which he was helped by the disgruntled Raven, himself formerly a servant of the City.

The Irish had not been moved from the Londoners’ lands as required, there were not nearly enough British settlers (and most of these were inadequately armed), both Coleraine and Londonderry were unfinished and underpopulated, the Company castles and bawns were for the most part inadequate, incomplete, or badly built, while jerry-building was endemic in housing, especially where green unseasoned wood from the forests had been used for building purposes. The great forests of Glenconkeyne and Killetra were being stripped of their assets and the whole Plantation (not just that of the Londoners) was in danger. It was cheaper to let Irish farmers stay on their ancestral lands rather than build English houses and import British settlers. Protestantism was not being imposed with suitable zeal or any great sign of success.

As a result of Sir Thomas’s efforts and several further surveys and enquiries the City of London was arraigned before the Court of the Star Chamber, and in March 1635 the Companies were ordered to surrender their Estates to the Crown, and proceedings were commenced to collect a huge fine of £70,000. At once the Crown began rack-renting, which demoralised the settlers further. King Charles dithered, and the City appealed to Parliament. By the beginning of 1641 the City of London was lining up against the King, and Parliament found that the City had been forced to undertake the Plantation: the Star Chamber’s judgment was declared to be unjust. Parliament ordered that the Londoners and all undertakers should be restored to their positions in Ulster. As a result of this episode the King’s position had been fatally weakened and he had lost the support of the most powerful bodies in the land. The Londoners began to retrieve their Estates and once more settlers and craftsmen sailed across the seas.

It was all too late anyway, for ominous news reached London in October 1641. A great rebellion had broken out in Ireland, and nowhere in the Kingdom was it more ferocious than in Ulster. The fortresses of Dungannon and Charlemont fell to Sir Phelim O’Neill, who was recognised at once by the Pope as Prince of Ulster, and was inaugurated The O’Neill at Tullaghoge. As Lord General of the Catholic army, he led the Irish Gentlemen and their retainers in a war that had been planned in the utmost secrecy, and which took the Government completely by surprise. Many experienced Irish soldiers and officers who had served in the Continental armies of the Great Powers landed in Ireland to join battle. Exiled English Roman-Catholic families promised support. Within two days a large part of Ulster had fallen. Moneymore and the Drapers’ lands fell to the O’Hagans, who put the settlers to the sword and the buildings to the torch; the defenders of Garvagh were massacred and their commander, son of the Agent of the Ironmongers’ Company, was killed; Agivey castle was besieged and Highland Scots massacred a British regiment at Portna. Virtually everything fell, was burnt, or rumbled, and the land was laid waste. Belfast, Carrickfergus, Enniskillen, Coleraine, and Londonderry were the only major settlements in Ulster to hold out, and Coleraine suffered from the problems of feeding and sheltering some 3,000 refugees. In 1642 the Roman-Catholic Bishops and Priests met at Kells, and the war was declared just. Any Roman Catholics who did not
join in the rebellion and who supported the Puritans were declared excommunicate. Thus was the confederacy of Catholics formed, and the Roman-Catholic population of Ireland, both clergy and laity, was openly in revolt against the Puritans from Great Britain and Ireland. This rebellion was in full spate when the Civil War erupted in England. The English parliament offered double portions of Irish land to adventurers willing to contribute to the suppression of the rebellion, so now the Catholics were fighting on the Royalist side, for King Charles was still King of Ireland. Not until 1649 was Cromwell able to land a large force of Parliamentarian troops in Ireland, and the rebellion was crushed in 1652, eleven years after the war had started. Roman-Catholic Priests were to be expelled from Ireland, Sir Phelim O'Neill was executed, and Irish land was distributed to those who had aided the Cromwellian cause. Yet the rebellion, in Irish eyes, was once again a war of the loyalists, monarchists, legitimists, and faithful against the forces or heresy, disloyalty, and illegality. At the end of the war the native Irish were even worse off than before.

Much of the Plantation lay in ruins, and it was only the walls of Londonderry, the ramparts of Coleraine, and the fortifications of Sir Thomas Phillips at Limavady that had ensured a foothold was maintained by the Londoners. Now a painful process or reconstruction began, but that too was brought to a sudden end by the Glorious Revolution of 1688. James II and VII was still King of Ireland, and it was in Ireland that the Jacobites rallied under a French commander. The Earl of Antrim, as commander of a Jacobite force, demanded entry to Londonderry in the name of the King, but that city had declared for William and Mary, hardly surprisingly. Once more, Protestant settlers crowded into the tiny city, and a great siege began. At this point Papal intervention played a crucial role, for, in order to contain the ambitions of the French King, Pope Innocent XI gave financial and diplomatic support to cement the Grand Alliance of France’s enemies: the Treaty of Vienna made the Holy Roman Emperor Leopold the ally of the Stadholder of the Netherlands.

Londonderry’s walls, some 16 feet thick, and bristling with the cannon supplied by the Livery Companies, held out, and in due course the Jacobites were forced to withdraw. Meanwhile the Irish Parliament repealed the Restoration land settlements, deprived Protestants of all their lands, and abolished the Londonderry Plantation. It was little wonder the Protestants fought so ferociously, and that the historical effect has been so long-lasting. In 1689 seven thousand French troops had landed in Cork, and Ireland became the centrepiece of the war. Sir Christopher Wren designed an “itinerant house for King William to carry into Ireland, for him to lye in, and that could be taken into pieces and carried on waggons and quickly fixt up”. This military caravan served its purpose, for in 1690 the Williamite forces drove the Franco-Jacobites back at the Battle of the Boyne, a victory that was celebrated in the Roman-Catholic heartlands of central Europe by the singing of the Te Deum in the mighty Cathedrals of the Holy Roman Empire. The war raged on until 1691, when the French commander was killed at the Battle of Aughrim, which was a close-run thing, and in which the Irish cavalry under Patrick Sarsfield had distinguished itself. That year saw the beginning of the penal laws against Irish Catholics which prepared the ground for the Protestant Ascendancy, but which drove the cream of Irish gentry and nobility to Europe - an event that became known as the Flight of the Wild Geese.

Conditions like those described do not produce fine towns or cities. During the eighteenth century the City of London suffered catastrophic losses as a result of the South Sea Bubble and other unwise ventures. The Plantation Estates were let out to middlemen who exploited the Proportions by stripping them of all remaining timbers, by rack-renting, and by reducing the tenantry (which by this time included considerable numbers of Presbyterian Scots) to penury. The result was that the Protestant tenants of the Londoners emigrated to America, where, as implacable enemies of London rule they helped to form the United States of America and defeat the British army in that land. No fewer than eight Presidents of the USA have been of Ulster stock. The Roman-Catholic peasantry, now moved to the poorest lands, was determined to remain somehow, although reduced to absolute degradation, so strong was the sense of belonging. Throughout, the Roman Clergy refused to cease to minister, and Mass was said in outlandish places, even out of doors on remote hillsides, whilst the Church still gave education to the poor. Thus Roman Catholicism and nationhood became insepurable, as in Poland, and Protestantism in the form of the Established Church never succeeded in winning the hearts and minds of the Irish people. Not until the disasters of the potato famine in the 1840s were the Roman-Catholic tenants forced to leave in numbers, and they too became implacable enemies of Britain. The Companies generally leased their Proportions for a number of lives, one of which was usually that of the King. As George III lived until 1820 the Companies did not regain direct control of their Estates until that time, by which the whole climate had changed. Ireland was now almost fully integrated as part of the United Kingdom, and the Irish Parliament had been abolished. Furthermore, a mood of evangelical philanthropy, of caring for the underprivileged prevailed, and the Londoners began to rebuild their neglected Estates.

The Mercers had abandoned their site at Movanagher (where one battered flanker survives) for the higher ground at Kilrea, and there they built a handsome mansion-house for their Agent to designs of William Barnes of London. Barnes supervised the reconstruction of Kilrea in the 1830s, including the Square, the main street leading off that square, and the main axis to the new Parish church. George Smith and William Barnes designed St Patrick’s church, Kilrea, which was completed in 1843 in the Romanesque style. Barnes also designed the Presbyterian church at Kilrea, and advised on the design of the Roman-Catholic church of St John the Baptist at Swatragh. Schools were also erected on the Estate to designs by Barnes and Turnbull, a local man, while money and design advice were given for a number of churches, including the Roman Catholic church of St Mary at Drumgarner, and the second Presbyterian church at Kilrea. An office was built at Killrea, and a large inn (The Mercers’ Arms) was built in the square at Kilrea beside the Market-House that had been built in 1834 to designs by William Barnes. By 1876 Kilrea was a well-planned and thriving little town.

The Grocers’ Proportion was fragmented, but in the nineteenth century, given a degree of stability, considerable works of improvement were carried out by the Company, including the building of a new Parish church to designs by John Bowden, and the erection of a new Court- and Market-House to designs by James Bridger, of 1823-6.
Several schools were put up to designs of James Turnbull of Limavady, while the Grocers’ camel motif can still be found on several of these buildings. Muff acquired an elegant manor-house in 1826 and several other excellent buildings in the course of the next few years. Most importantly it had Grocers’ Hall, which was a school for the sons of farmers, and had previously been the residence of the Grocers’ chief tenant. Nearby was the Templemoyle Agricultural College which gave training in all branches of agriculture: both establishments were greatly admired by Thackeray and were described by him in his Irish Sketchbook.

The Drapers began to reconstruct their Estates from 1818, using designs by their architect and surveyor, Jesse Gibson. Part of the old bawn and castle survived at Moneymore, and on them Gibson built his Neoclassical schools, completed in 1820. He also designed a free-school at Blackhill, another at Cranny, and an inn, market-houses and dispensary in Moneymore. Gibson was succeeded by William Joseph Booth, who travelled to Ireland in 1827 to make a survey that included a series of ravishing water-coloured drawings: Moneymore from the quarry; Moneymore from the road to Stewartstown; a view from the inn showing part of Gibson’s schools; the mill at Moneymore; a general view of Draperstown; Draperstown from the Parish church; the parish church itself; and the schools at Cranny show the state of play then. Booth was to continue the work of reconstruction that had begun in 1820. The old Parish church at Moneymore was demolished, and a new one was built by the Company in a Romanesque style to designs by Booth. A second Presbyterian church was erected, while a Common Barn and a new Market-House and Corn-Store were also put up, with gaol and Superintendent’s house behind. Most spectacular of all, however, was Booth’s scheme for Draperstown, which included a new Presbyterian church of stark Neoclassical simplicity, and a whole range of buildings, now sadly decayed, that included an inn and a court-house as well as dwellings.

On the Fishmongers’ lands there were the remains of the bawn and flankers, an 18th-century house at New Walworth, a fine Parish church with a splendid funerary monument inside, and a few hovels. Richard Suter, the Company’s architect, got down to work and reconstructed Walworth House for a start. He also produced handsome designs for the Presbyterian churches at Banagher and Ballykelly, for the model farm at Ballykelly, for the Agent’s house there, for the Lancasterian schools, and for the dispensary, not to mention a number of houses and a sexton’s cottage. Fixed to the dispensary wall was the splendid carving by J. G. Bubb of London, showing the Fishmongers’ arms. Numerous schools to Turnbull’s designs were erected throughout the Estate, and the Company’s Proportion, on some of the best land in the County, was suitably embellished with fine buildings and ornamented with a major scheme of tree-planting and land reclamation.

The Skinners acquired Pelilpar House as their Agent’s house, while the Salters gradually developed their capital at Magherafelt, which, by 1850, was a thriving market town. Fine churches, schools, court-houses, and a sumptuous manor-house (designed by Robert Garland of London) enriched the Estate.

On the Ironmongers’ lands Lizard Manor is an excellent example of the standard required for an Agent’s house on one of the Company’s Estates, while Aghadowey Parish church represents a type of Irish Georgian Gothic so beloved by the Anglican Church in that Country. On the Clothworker’s lands are the delightful Parish church at Articlave, the Glebe House at Dunboe, and, an amazing survival, Hezlett’s House, a building of the seventeenth century. The Company began improvements at Waterside, opposite Coleraine, to designs by Samuel Angell. One of the first was the Clothworkers’ Arms hotel, a dignified block by the River Bann. Waterside also acquired its classical court-house, designed in 1852 by Stuart Gordon, and a fine school by Isaac Farrell of Dublin, the Coleraine Academical Institution. The most outstanding achievement on the Estate was the building of Castlerock, a holiday resort that was developed to designs by Angell. Buildings are distinguished and include a bathing-lodge, several villas, and an inn. This resort was intended to take advantage of the new railway-line linking Belfast, Coleraine, and Londonderry, and it was further embellished with its Parish church consecrated in 1870 by the Bishop of Derry, whose wife, the celebrated Cecil Frances Alexander, wrote a new hymn for the occasion. The architect was Frederick William Porter of London, who also produced a plan for laying out the Company’s lands at Waterside-Killowen in 1860. Castlerock also boasts a fine range of cottages known as the Twelve Apostles, designed by Godwin in 1882.

The Honourable The Irish Society embellished its Estates, enriching the Cathedral, which had acquired some extraordinary funerary monuments in the course of the years including some astonishingly uncounted designs from the 1670s, showing how far behind taste actually was in that remote part, and the array of fine Neoclassical designs, including an excellent Behnes. The Maiden City got its Greek Revival court-house, designed by Bowden, and the headquarters of The Irish Society, which still maintains offices in the city. Henry Roberts, no less, produced designs for model dwellings for the labouring classes which were realised by The Irish Society at Culmore. A new town hall was built at Coleraine, schools, halls, and houses were erected; churches were repaired and rebuilt, and a new house for The Irish Society, known as Government House, Termoanbacca, was erected to designs by William Tite on the incomparably lovely banks of the Foyle.

Finally, a Guildhall was built in Londonderry at the turn of the century, embellished with glass that tells the story of the Plantation. It is one of the great paradoxes that this building, badly damaged in the present Troubles, has just been lovingly restored, with all the glass superbly conserved, and the London connections made plain. The Maiden City of Londonderry is an amazing achievement, with one of the finest sites of any city in Europe. The buildings of the Londonderry Plantation survive to remind us of an astonishing episode in the Nation’s history, and one that is either unknown, ignored, or wilfully misunderstood.

James Stevens Curl.  
Professor of Architectural History,  
De Montfort University,  
Leicester. LE1 9BH.

Professor Curl’s book The Londonderry Plantation (1986) is still available from Phyllimore & Co. Ltd., Shopwyke, Manor Barn, Chichester, West Sussex, PO20 6BG.
COSTS AND BENEFITS OF BAT CONSERVATION

Dr Robert E. Stebbings

Summary of Lecture delivered on March 15th, 1993

Our increasingly cost/value driven society, and especially all levels of Government, is no longer satisfied by exhortations of the kind which advocates maintaining the status quo by stating "because it has always been done like that"!! No longer can we say "no, we do not want that development" without pressing the point with hard economic values and benefits to society which, in cash terms, out-value the estimated benefit of the development.

We are now in an environment in which wildlife conservationists have to argue with financial specialists the value of species or habitats. Questions to be addressed include "is a rare species worth more than the abundant; are aesthetically pleasing species such as otters and seals more valuable than a grass snake or spider?" In some cases, world-wide, over the last 15 years such questions have been raised in relation to bats and attempts made to justify the case for protection.

Calculating the cost value of any aspect of wildlife can be highly subjective and is dependent on which set of criteria are selected. For instance, what value would each individual place on seeing a live long-eared bat in its roost. Some people, perhaps most, would be dis-interested and therefore it could be said a long-eared bat has no value to them. But at least three other classes of observers would put a monetary value on the bat depending on their set of criteria.

Firstly, there are those who would (and do) spend a day searching for the chance of a glimpse of one bat. The expense of travel might be assessed for say 100 miles by car at an economic cost of £40, and a days time could be given a value of £50. A total of £90 to see one bat. Some people spend far in excess of that, just to know, let alone see, a bat is in a safe place.

Secondly, there remain those in our population who fear bats and would pay to have them removed from their property; again, perhaps £50 or more for one bat as a pest control operation (assuming legal aspects have been addressed satisfactorily).

Thirdly, if someone, without licence, deliberately killed a long-eared bat, that person could be summoned to court, given a fine amounting to a maximum of £2000 and ordered to pay costs.

These illustrations show that one small, 7gm bat has an intrinsic value. But could we say a long-eared bat is of 'benefit' to any of those four categories of people. Perhaps, the naturalists wishing to gain self-satisfaction at seeing a bat, would feel rewarded; the State on receiving a fine will have some more easily recognised tangible asset, but most people with no interest in bats and those wishing to be rid of bats could not be said to 'benefit' from them.

Long-eared bats are found in northern temperate climates and feed on insects, but in the warm, especially tropical countries, many species of bat can be regarded by humans as a very valuable asset, contributing in real terms, significant amounts to a country's wealth.

By the 1970s an important agricultural industry had developed in Malaysia involving the growing of a large forest tree, the Durian, which bears a large melon sized fruit considered by many to be a much loved delicacy. Unfortunately at that time, this crop, worth $100,000,000 a year, began to fail with the flowers not setting fruit. Biologists had long recognised the fact that the tree was pollinated by a bat, one which roosts in large caves. In all, there were few Malaysian caves sheltering these bats, the most important being at Batu near Kuala Lumpur. Here the limestone massiff containing the caves was being quarried for stone to make roads, so destroying some of the caves including places where bats roosted. Also, the animals were being caught in large numbers as food. These activities subsequently reduced the size of the bat population and ultimately resulted in few flowers being pollinated. The crop failed with a devastating loss to individual farmers and the loss of about 6% of the gross national product (GNP) for Malaysia at that time. Eventually the Government, after years of lobbying, protected the caves and bats and the crop is now restored to full productivity. This kind of direct link between bats which pollinate plants and loss of income as the bats are over exploited, is repeated throughout the tropics. A similar problem has occurred in Mexico where the farmers traditionally made Tequila liquor by extracting sugars from a few species of the Agave genus of plants. In this case, the plants grow for 10 - 15 years and then put all their reproductive energy into one large flower spike growing 5 - 8 metres high. As the flower spike develops at the base of the plant, the stem swells considerably before the flowering spike shoots up. At the swollen stage farmers cut the plant, thereby killing it, to extract the sugars and ferment the product. Unfortunately, one species of bat is dependent on that flower spike for food and the plant is dependent on the bat to effect pollination. Because, the plants have been over exploited, now there are insufficient plants flowering at one time to sustain the food requirements of the bats, consequently bats have died out over large areas; and for those scattered remaining plants which do flower, there are no bats to effect pollination. Hence, this bat/plant inter-dependency has broken down and both species will die out unless we step in and replant the Agave.

A wide range of foods and products are obtained directly or indirectly from bats. Plants such as bananas, plantains, durians, balsa, sisal and kapok are examples of plants pollinated by bats, but these animals are also responsible for effectively dispersing seeds of many others, for example Guava (once vital to us as a source of vitamin C in 1939-45 war) Iroko timber (once a $140,000,000 per year export crop from Nigeria), almonds, avocados, cashew, cloves, dates, figs, mangos and many others. Indeed, more than one thousand species of plant which have a dependency on bats
for seed dispersal or pollination are used in world trade and many of these end up in our homes, even in chewing gum.

Therefore, there are direct tangible benefits to us all in conserving stocks of bats and the habitats on which they depend.

However, our own bats, now 14 resident species as one was declared extinct in 1992, cannot be described as being of economic importance in the easily recognised sense. Being insectivorous, they do not pollinate our crops or disperse seeds, although they may reduce some agricultural or silvicultural pests, as bats are known to eat moths whose caterpillars feed on crops. These small, long-lived bats (living up to 30 years) are slow breeding (average one live young every second year), and have declined in abundance principally due to loss of habitat. This includes loss of hollow trees and grazing pasture, their principal source of roosts and insect food.

One example of a most severe decline concerns the greater horseshoe bat, a species usually found only in south-west England and Wales, but in 1992 an exceptional vagrant turned up in Leicestershire. It is believed the British population of this species numbers about 4,000 individuals which amounts to a 98.5% reduction in the estimated population of earlier this century.

Much detailed research is being conducted into the causes of this decline, vital research if we are to understand how to prevent further loss and hopefully how to reverse the trend. It is estimated that nearly £600,000 has been spent on research and additionally, amateurs have freely contributed their time and skills. As a result we know much more about the biology and ecology of this social animal and the fact it appears to be more demanding than other bat species for its survival needs.

Firstly, it requires large roof spaces for breeding, whereas, formerly, caves were used which have been taken over by tourists eg. Cheddar Caves.

Secondly, the species breeds much slower than others, with females, on average, being nearly six years old before having their first baby, then breeding only every second year until they are about ten years old.

Nightly they fly up to 10 kilometres radius from their roosts in order to find food but they are dependent on large tracks of woodland and grazing pastures. In lowland Britain where the species occurs, these habitats are now highly fragmented, requiring bats to spend valuable energy commuting between the feeding places and therefore, having less energy for reproduction.

It is only by undertaking detailed ecological research that we can discover how an animal lives, the critical needs for its survival, and how provision of these may be achieved. Such research is long-term and expensive, but the ultimate benefit to us, the arbitrators on the future of our plant, is hopefully, a diverse countryside which we will enjoy most and which also, will sustain the maximum diversity of wildlife of the future.

Overall, bats are important for human welfare and we have the future survival of bats delicately balanced in our hands. Worldwide, already we have caused the extinction of some species. Are we yet concerned enough to allow this trend to continue? Without considering these benefits we could be amongst the losers.

The Robert Stebbings Consultancy Limited,
74 Alexandra Road,
Peterborough PE1 3DG.
THE HIDDEN MOUNTAINS OF LEICESTERSHIRE

M.J. Le Bas

Abstract: Leicestershire, like most of the Midlands, is not regarded as a particularly hilly county, except perhaps for the Charnwood Forest area. But go to the top of Croft Hill, 420 feet OD (128 m), and you are standing on the summit of a rather special mountain. It is a buried mountain, and is one of several such summits in Leicestershire formed a few hundred million years ago. Together, they make a chapter in the early history of the county.

Croft Hill is more than just a hill, it is the top of a buried mountain, the lower slopes of which have been enveloped and buried by Triassic sandstones 200-250 million years ago. Standing on top of Croft Hill and looking southwest, you can see a rise in the ground making the low hills of Stoney Stanton two miles (three kilometres) away. Looking a similar distance to the northeast, you will see the low hills on which Narborough and Enderby stand (Fig. 1). The resistant rocks that make all these hills are igneous and granitic in composition, more specifically dioritic to tonalitic. Being hard rocks, which are a rare commodity in SE England, they are obvious favoured sites for the extraction of crushed stone for constructional purposes, and most of the hills have had, and a few still have, quarries sited on them. Croft Quarry is one of the few remaining active quarries, and is now so deep that stone is being taken from well below sea level and is, at the same time, revealing mineralogical relationships of great scientific importance.

Tops of granitic hills of the same age also occur at Castle Hill and Buddon Wood near Mountsorrel, but as elsewhere, these hills have been decapitated by quarrying activities. Rocks of related composition occur at Nuneaton, where they were emplaced as sills intruded into Cambrian shales. They too have been extensively quarried.

From Nuneaton to Mountsorrel there is a range of buried hilltops, but only the hill at Croft gives visible evidence of their origin. Driving along the M69, the striking low triangular outline of Croft Hill breaks the otherwise flat scenery (Fig. 2). You would be excused if you thought it was a tip heap, like that at Tuttle Hill, also known as Judkins Hill, on the northwest edge of Nuneaton just over the county boundary in Warwickshire, because the latter hill is a tip-heap, or was, because it is now grassed over to disguise the fact.

Past drilling operations around Croft Hill show that the slope of the hillside above ground level, continues below ground level (Bosworth 1912), and that what we are seeing at Croft Hill is the tip of a big hill or mountain which is estimated to be about 90% buried (Fig. 3). The observation of buried mountains is not new; Watts described them in his 1903 paper on the landscape of Leicestershire, but he thought Croft and the hills nearby were part of the older Charnwood Forest structure, whereas we now know that they are separated in age by some 200-300 million years (Le Bas 1972). The burial of the hills took place at the time when Britain lay some 20° north of the equator 200-250 million years ago. The climate of Britain then was hot and dry apart from seasonal rains when reddish sands and muds were laid down in ephemeral lakes and around river courses (similar to parts of the Middle East today), and these sands and muds accumulated in thickness until the pre-existing mountains were buried. Erosion is slowly reversing this process and revealing these mountains: Croft Hill is thus an exhumed mountain top and provides a good example of the exhumation process.

The flatness of the surrounding scenery (Fig. 2) is the product of flat-lying glacial tills and fluvi-glacial gravels and sands, most of which accumulated in the glacial Lake

Fig. 1 (left). Map showing the distribution of the buried hill-tops (shaded areas) southwest of Leicester, their alignments (dash-dot lines) and the possible trace of the Thringstone Fault (heavy dashed line). 1 Warren Quarry; 2 Rawson’s Pit; 3 Enderby Hill Quarry; 4 Coal Pit Lane Quarry; 5 Red Hill Quarry; 6 Narborough Quarry; 7 Huncote Quarry; 8 Croft Quarry; 9 Barrow Hill Quarry; 10 The Yennards Quarry; 11 Clint Hill Quarry; 12 Town Quarry; 13 Cary Hill Quarry; 14 Old Quarry; 15 Lane’s Hill Quarry; 16 Granitethorpe Quarry; 17 Sapcote (includes Windmill) Quarry; 18 Calver Hill Quarry.
Harrison that covered much of this region in the last stages of the Pleistocene glaciation, and some are from the Soar floodplain. These deposits are red, because they are derived from the underlying red Triassic sediments, which around Croft occur at depths usually less than 20 feet (6 metres).

Whilst the low hills at Sapcote, Stoney Stanton, Barrow Hill, Narborough and Enderby do not now show any sharp summits, Croft is unique in retaining its sharp Triassic form. Quarry excavations and drilling show that the others are also steep-sided below ground level, but above ground level the profiles of the tops are contrasting flatter. It might be that these tops were shaved flat by the ice sheets of the last glacial period, whilst Croft Hill being higher, managed to stand clear above the ice sheet. The flanks of Croft Hill can have received only moderate erosion from the ice because the small Triassic valleys carved into the igneous rocks of Croft can still be seen at intervals along the rim of Croft Quarry. But recently drilled boreholes for the proposed (1992) eastward extension of the quarry do show, in places, glacial boulder clays heaped against steep and fretted (by ice?) surfaces of the igneous rock.

There is little today to give evidence of the former shape of Clint Hill at the northern end of Stoney Stanton, because it is now replaced by a deep old quarry full of water. But Bosworth's 1912 map of the former quarry workings at Clint Hill and the depth of the surrounding overburden, suggests a small steep-sided hill with slopes of over 30° in places rather like Croft Hill, but with the 50 feet of its summit removed. Whether the removal was by glacial action or by quarrying in the last century, is not certain as the oldest available topographic maps of the area (1890) show a deep quarry already there, but the name 'Clint' means a sharp rocky prominence or cliff in old Danish, suggesting that the latter was the removal process.

Clint Hill is not the only 'hill' in Sapcote-Stoney Stanton area. A Roman villa stood on Calver Hill, southeast of Sapcote. The villa site was quarried away a century or so ago. Immediately to its north was another hill with a windmill on it, but which is now marked by the enormous and water-filled Old Sapcote Quarry. More quarries at Lane's Hill and Mill Hill, the present-day site of the Stoney Cove aqua-sports centre, mark more former hill tops. Thus there is quite a complex of buried hill tops, and this is repeated in the Enderby area and elsewhere in the region. Quarrying activities have ceased in most of these areas, and therefore evidence has to be gleaned from records such as Bosworth (1912) and old Ordnance Survey topographic maps. If the tonnage of stone removed from these quarries were known, perhaps the size of the former hills could be estimated.

In Leicestershire, different boreholes have recorded different thicknesses of Triassic sandstones covering the basement rocks of the region. The thicknesses vary from 500 feet to 1000 feet (150-300 m), e.g. under Leicester the Triassic is about 750 feet (225 m) thick (further data are given in appendix on pages 57-58 in Le Bas 1968), but most of these boreholes are one hundred years or more old, and the figures although reasonable must be taken with caution. Underlying the Triassic sandstones, are basement rocks composed of Lower Palaeozoic shales and slates, and the interface between the Triassic and Palaeozoic sediments provides a sufficient density contrast for it to be detectable by geophysical means. In the vicinity of Countesthorpe, a seismic refraction survey, reported by Arter (1982) reveals an irregular surface to the Palaeozoic basement, with Triassic rocks some 800 feet (250 m) thick. East of Mountsorrel, where the basement was calculated to be Chamotte, Arter shows that the Triassic rocks were more irregular, with thicknesses varying between 800 and 1000 feet (250-300 m). In the Enderby-Stoney Stanton area, the Triassic shallows and averages 300 feet (90 m), and rises to the surface where it surrounds each of the previously mentioned hills. Southwest of Sapcote, the Triassic rocks appear to thicken to about 1000 feet (300 m). Thus Croft Hill is the high-spot in a 15 mile (25 km) stretch of pre-Triassic mountainous terrain.

Into this Palaeozoic basement were intruded the plutonic igneous rocks now forming the above-described hills. Since mountains are usually considered as steep-sided tracts of land standing relatively sharply 1000 feet (300 m) above the surrounding tracts of land, these hills would qualify for description as mountains if the enveloping Triassic sediments were ignored.

The shape in plan of the buried mountains is curious. These igneous masses lie in lines (Fig. 1); for instance: beginning in the north at Barrow Hill near The Yennards, the line continues through Clint Hill, Lane's Hill and Stanton Top Quarries and Old Sapcote Quarry, to Calver Hill. This line runs NNW-SSE, and several of the individual buried hills of igneous rocks are also elongated NNW-SSE. In a similar manner, the Huncote-Croft mass of igneous rock shows a north-south alignment. The three igneous masses of Rawson's Pit (north of Enderby), Enderby Hill and Red Hill of Narborough, may also represent a north-south alignment. That all these might originally have formed a single line subsequently off-set by NE-SW faulting, seems unlikely. More likely is that the alignments follow faults. If the faulting was Hercynian in age (ca. 300 million years), then an interval of erosion followed by burial with Triassic sands could account for the preservation of a landscape marked by foot-wall uplift. The likelihood is that the faulting is related to the Thringstone Fault, which is still seismically active.

Although the underlying Precambrian and Lower Palaeozoic geological structure of Britain is generally well known, our knowledge of it, beneath Leicestershire is surprisingly weak. What happens a thousand feet below the surface of most of the county, is informed guesswork. At Barron Park west of Kirby Muxloe, however, what happens at a hundred feet (30 m) is anybody's guess, as the cross-section below the 1982 Geological Survey 1:50,000 map of the Coalville area glaringly shows.

If the structure were known, it would almost certainly enable geologists to reconstruct the fragmentation of the continental microplates that occurred in the plate tectonic collision between the English remnants of the Gondwana plate with the plates of Laurentia and Baltica. The direction in which the collision took place and which pieces of ocean floor disappeared in the process, are much argued. One of the best lines of evidence comes from interpreting the igneous rocks, both volcanic and plutonic. The Lower Palaeozoic island arc volcanic rocks of the Lake District and the underlying plutonic granitic rocks in northern England indicate that an ocean lay to the northwest, and that closure of that ocean was in a NW-SE direction. The similar Lower Palaeozoic igneous rocks in the Midlands, and in Leicestershire where they are best seen, are interpreted to indicate that another ocean lay to
Fig. 2 (top). Croft Hill from the North

Fig. 3 (above). Cross-section through Croft Hill showing the steep flanks of its buried surface. The igneous rock ‘hill’ to the west is the southward extension of the Barrow Hill-Yennards igneous mass. Vertical exaggeration is x2.

the northeast (Pharaoh et al 1991). Further similar rocks beneath Belgium support this (Andre 1991).

Although seismic and other geophysical techniques will be applied and will help solve the problem, geological interpretation still largely depends on the interpretation of the rocks which we see at the surface. Croft Hill is the last identifiable remnant of the mountains that graced the Leicestershire sky-line. It is a real ‘ancient monument’ which still holds geological secrets waiting to be discovered.

REFERENCES


TURKIC-TYPE OROGENY IN THE ALTAIDS: IMPLICATIONS FOR THE EVOLUTION OF CONTINENTAL CRUST AND METHODOLOGY OF REGIONAL TECTONIC ANALYSIS

A. M. C. Şengör

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Gratefully and respectfully dedicated to the geologists of Russia, who, for many generations, unveiled, through frequently heroic exertions, the magnificent geology of Northern and Central Asia for mankind.

ABSTRACT: Collisional type orogenic belts may be classified into three superfamilies on the basis of the attitude and width of their sutures, which seem a function of the size of ocean lost before the collision (measured as length of oceanic lithosphere subducted), namely 1) Alpine-type, 2) Himalayan type, and 3) Turkic-type. Of these, the Turkic-type orogens are characterized by the presence of very large subduction-accrretion complexes forming very wide (on the order of several hundreds of kms) "sutures". Magmatic arc axes migrate into these subduction-accrretion complexes from their original positions as they grow and consolidate them by plutonism. Further consolidation occurs when spreading centres are subducted and cause widespread HT/LP metamorphism, in places reaching granulite grade. Changes in slab dip and buoyancy and subduction incidence angle commonly induce complex "out-of-sequence" deformations on growing subduction-accrretion complexes including major strike-slip shuffling, as do the collision with them of various buoyant entities such as microcontinental fragments including island arcs, fracture zones, guyots, and large delta complexes.

The growth and collision with one another of giant Turkic-type orogens dominated the evolution of Central and parts of Northern Asia during the Palaeozoic. The Ural, Tien Shan, Kazakhstan, Altay/Sayan, and the Mongol Okhotsk orogenic belts making up the Palaeozoic Altait tectonic collage to the west and south of the Angaran Craton may have evolved along a single magmatic arc. This arc, the Kipchak arc, rifted in the Cambrian from a combined Baltica/Siberia and became a multiple orocline through the Palaeozoic both by strike-slip repetition and actual bending by the rotation and convergence of the by then separated cratons of Baltica and Siberia. During this evolution, growth of a giant subduction-accrretion complex in front of this arc added about 5.3 million km² new area to Asia, about half of which may be juvenile crustal material. The growth of the giant Altait subduction-accrretion wedges in the Palaeozoic may have been favoured by sea-level generally lower than that in much of the Mesozoic because of the persistent Palaeozoic Gondwanian ice caps. Continental enlargement and perhaps even growth may thus be aided by widespread continental glaciation.

INTRODUCTION

Like all sciences, geology was born in Europe. But it inherited one Alexandrian concept, namely that of a mountain belt. Eratosthenes, the ingenious director of the Museum, followed Dicaearchus in dividing the inhabited world, i.e. the Oecumene, into two moieties by a line of latitude called the Diaphragma that followed the latitude of Rhodes parallel with the long axis of the Mediterranean and a mountain range which trended straight from Asia Minor to northern India and beyond (very roughly along the present 36°N lat.; cf. Berger, 1903, esp. pp. 417ff.). Dicaearchus had called this mountain range Taurus, a word which originally stems from an Aramaic root, tur, meaning both mountain and bull (cf. Şengör, 1992a). Strabo tells us that Eratosthenes believed, on the basis of the reported marine fossils and salt lakes high up in the mountains of eastern Turkey and Iran, that the Taurus had risen out of the sea as a consequence of repeated earthquakes (Strabo, I. 3. 3-4).

Mainly through Strabo's great influence, Eratosthenes' Taurus soon became the model for all mountain ranges and his interpretation of vertical uplift survived well into the infancy of geology (Fig. 1A; see esp. Michell, 1760; Pallas, 1778; also Schmaler, 1904). This idea of a mountain axis naturally led to the concept (but not yet the term!) of forelands and to an early distinction in geology of mountain structure versus non-mountain structure (Michell, 1760, esp. his plate XIII, and pp. 582ff). Elie de Beaumont's analogy between the forelands and the "jaws of a vise" is based on this image (see Elie de Beaumont, 1852, p. 1317; "...comme les deux mâchoires d'une étau...") and in its turn it became the model for all orogenic belts down to our present day (Fig. 1B and C), including the early plate tectonic models.

In his monumental The Face of the Earth, Eduard Sues developed a different view of mountain-building based mainly on his interpretation of the structure of Asia: He thought that waves of folding and thrusting emanated radially away from the old Angaran nucleus and its ancient frame of mountains ("the old vertex" of Sues). He contrasted this view with the Beaumontian picture as being similar to the difference between the waves of the open sea and the breakers on the shore.

On the basis of the Russian observations, Alexander von Humboldt and later Eduard Sues remarked that the mountain ranges north of the Takla Makan desert all the way to the Ural in the west and the Yenisei valley in the east had been made up dominantly of schists and igneous rocks. Ophiolites were rare, which was very unusual from the viewpoint of the Beaumontian model:
Eratosthenes to Leopold von Buch
(2nd century BC - 19th century AD)

A

Foreland → Foreland

Mountain axis locus of uplift between unaffected forelands

L. Elie de Beaumont to
Leopold Kober
(1831 to about 1970)

B

Foreland → Foreland

"Mountain system" or "orogen" compressed between the "jaws of the vise" formed by forelands

Orogen still interpreted in terms of the "jaws of the vise" analogy

Popular plate tectonics
(1970 to present)

C

Hinterland (=backstop)

Suess (1875-1909)

D

Foreland → Hinterland

Waves of mountain-building radiating away from the hinterland (no "jaws of the vise analogy")

This paper

E

Growing subduction-accretion wedge similar to Suess' "waves of mountain building"

△ Active arc volcano
△ Deactivated arc volcano

Oceanic crust
Continental crust

Orogen
"We may first observe that in these great mountains, as well as in the whole western part of the Altay to beyond the Iritysh, not a single band of gneiss of any importance is known to exist; indeed this rock is seldom met with at all in these mountains, and never except as a strictly local occurrence, a remarkable contrast to what is found in other lofty folded ranges. On the other hand, we meet with schistose rocks in surprising abundance, micaschist, chlorite schist, and clay slate, the last named with beds of limestone, and towards its summit Devonian or Lower Carboniferous fossils, which are found at many localities. These schists, like those in the Salair and the Alatau, are pierced by granite, syenite porphyry, and diorite in dykes and bosses. In the contact zones lie many of the famous ore-bodies of the Altay. The basalts of the ancient vertex have now disappeared. The intrusive masses seem to form many of the goltzi; but by no means the whole of them". With these words Eduard Suess not only echoed von Humboldt's much earlier conclusion that "clay slates appear to be the dominant rocks of the Altay" (von Humboldt, 1843, p. 286), but also summarised the results of the later mammoth work of many generations of Russian geologists concerning the dominant rock-types within the broad curve of the Iritysh up to the ancient vertex, i.e. the Angaran craton (Suess, 1901, pp. 202-203). But, the situation Suess did not find to be markedly different elsewhere in Central Asia north of the imposing Tethyside chains. In the region of Khan Tengri of Tien Shan, for example, he re-emphasized, after J. W. Ignatiev, that "Gneiss, even in the mountains, is much more seldom observed than is usual in the mountains of such height" (Suess, 1901, p. 212). Another point that recurs frequently in Suess' descriptions of the rocks of the Central Asian mountains is the common occurrence of "broad bands of diabase" found amidst the slates and the schists that are in places accompanied by serpentinite (Suess, 1901*).

The structure of the mountains of Central Asia Suess contrasted with such mountain ranges as "the Caucasus, Carpathians, Pyrenees, or Appalachians (where) we may inquire whether its structure is symmetrical or asymmetrical, on which side its foreland lies..." (Suess, 1901, p. 246). In Central Asia, however, "the separate chains do not possess the same degree of individuality as is observed in the Caucasus and similar chains;...this becomes intelligible, as soon as one considers these chains as waves belonging to a common movement; but considered separately, their diverse composition becomes incomprehensible. The unity of the movement accounts for the absence, within the chains, of a contrast, such as occurs in the Alps and the Himalaya, with an alien foreland of different structure. It is the difference which exists between the waves of the open sea and the breakers on the shore" (Suess, 1901, pp. 247-248). The whole structure and its evolution Suess visualised as follows: "In order to obtain an approximate idea of the configuration which is thus developed, let us imagine the whole of that part of Asia which lies to the south-west to be covered with water. Let an impulse originate from the Iritysh or the Tarbagatai and let us follow its effects towards the southwest. Numerous long mountain waves arise one behind the other; at first they are more or less convex towards the south-west, as in the branches of the Tien-Shan. They broaden out and elongate, or diverge from one another, where they find room enough.... They crowd together and rise, towering up, where the space grows narrower.... Sometimes they sweep past obstacles, stilt and straight... continually seeking a lateral prolongation; sometimes, on the contrary they are impeded by these obstacles, bent and turned aside. At first the universally predominant direction is to the north-west or west-north-west. It is this folds or waves that we group together as the Altaids" (Suess, 1901, p. 250).

Suess' view found little sympathy within the geological community, for his way "simple was taken for a mechanism and found absurd (e.g. Löwl, 1906, p. 173). Nearly all geological studies immediately following Suess' milestone synthesis took a Beaumontian rather than a Suessian view of the Asiatic orogens (e.g. the influential syntheses of Haug, 1907, Kober, 1921, Stille, 1924, and Bucher, 1933).

The one remarkable exception was Argand. He showed in his immortal La Tectonique de l'Asie (Argand, 1924) that Suess' metaphor had one possible explanation if one admitted the possibility of continental drift. Continental drift in the open ocean led to accretion tectonics through the piling up of oceanic rocks before the prow of a driving continent, similar to the waves before the prow of a ship. Continental collision then threw the entire continent into waves of "basement folds" (pis de fond). Although his genius was much admired, the geological community did not find Argand's arguments convincing. Its members were too deeply entrenched in the to the one illustrated in B, except the subduction. Some early plate tectonic theorists of orogeny championed the compressional origin of subduction-related orogenic belts as against a thermal welt model. But both models required the jaws of the vise analogy.

D. Suess' metaphor of migrating wave fronts illustrated, Suess required the "impulse" to originate in the hinterland, but left its nature in the dark. His model of mountain building seemed to require the independent motion of parts of the orogenic belts without any necessary convergence between foreland hinterlands (see Şengör, 1982, fig. 4) as in a three-plate situation. This led to much criticism from the side of the 20th century fixists later.

E. Suess' metaphor explicable if the orogen grows with time onto the subduction zone. Note that while the two plates converge, the hinge line of the subduction may retreat away from the hinterland plate. As the subduction-accretion wedge grows, the magmatic front migrates oceanward in the wake of the trench. Following a collision, the whole system will become a Turkic-type orogen.
Beaumontian position and few, if any, had Argand’s breadth of knowledge and flexibility of mind. Argand ignored them and stopped publishing and they ignored Argand and continued to pour out masses of Beaumontian literature.

Early plate tectonic interpretations of orogeny were conceived in this Beaumontian atmosphere and his "jaws of the vise" analogy was applied to both subduction-related and collision-related orogens (e.g. Dewey and Bird, 1970a,b; Coney, 1970,1973).

Around the Pacific, however, many geologists noted the growth of the continents towards the ocean. The traditional, "Beaumontian" interpretation of this observation was to assume many collisions to add bits of "readymade" continent or buoyant objects behaving like continents (e.g. island arcs, giant delta complexes, large oceanic plateaux) onto the circum-Pacific continental cratons. Beginning with Wilson (1954) in pre-plate tectonics days and later with Moores (1971) this is what most American geologists thought and this thinking eventually led to the "terrane" concept in the North American Cordillera. An American minority (e.g., Hamilton, 1969; Hist, 1972) plus some Japanese geologists (Matsuda and Uyeda, 1971) thought by contrast that the growth of subduction-accretion wedges without many collisions was the main mechanism of continental enlargement with concurrent migration oceanward of magmatic arc fronts.

Orogenic belts now in the interiors of continents have been largely outside this quiet controversy, for they comfortably fit into the "jaws of the vise" analogy. Some geologists working on these now intracontinental chains even thought that "the vise is not a metaphor but a fairly exact model" (Rogders, 1970, p. 224). Geochemical arguments allegedly precluding much continental growth since the beginning of the Proterozoic (see Taylor and McLennan, 1985, ch. 10, for a summary and the main references) were in comfortable agreement with this Beaumontian model of orogenic belts as narrow strips episodically squeezed between large, stable entities.

Russian geologists working in Central Asia and Siberia, however, had a structure before them that was difficult to reconcile with Elie de Beaumont’s simplistic model and that earlier had inspired Sue’s to pronounce his "waves of the open sea" metaphor. They noted, for example, that the "geosynclinal development" here had remained incomplete and that true foredeeps had not come into being in Siberian and Central Asian ranges until the late Palaeozoic, so that it seemed difficult to interpret the early Palaeozoic orogenies (which they called, still following another Beaumontian tradition "Caledonian") in terms of the jaws of the vise model, for at least one of the "jaws" seemed absent (e.g. Janschin, 1968).

The great Russian geologist Alexander V. Peive and his collaborators saw as much and divided the evolution of Northern and Central Asia into "oceanic", "transitional", and "continental" stages, whereby they underlined the importance of the principle of actualism to interpret these stages (the "transitional stage", for example, they interpreted to be represented by island arcs, marginal basins, and deep sea trenches: Peive et al., 1980). But Peive and his friends suffered from a nearly universal shortcoming in the earth science community of the former Soviet Union: The bigotism of the Marxist-Leninist state religion had made it highly undesirable to import in toto any intellectual product from the "decadent capitalist world", which, in the seventies, regrettably included plate tectonics! If Peive could have allowed himself to accept plate tectonics, it might have been unnecessary for me to deliver this lecture, for all I shall do here is to cast his and his friends’ conclusions into plate tectonic terms and then draw some consequences they were prevented from drawing owing to their rejection of plate tectonics. I believe that these consequences make the Palaeozoic geology of Central and Northern Asia intelligible, they indicate why here the Beaumontian model fails and why Sue was driven to his metaphor of propagating waves from the ancient vertex of Asia to illustrate their evolution. They also indicate how right Peive and his co-workers were in their identification of the various stages of continental evolution from oceanic to continental and how suspect the models that deny significant Phanerozoic continental growth now seem.

The main purpose of this lecture is to explain essentially the observations on the geology of the AltaiSyndes synthesized by Sue nearly a century ago with incredible insight. Geological work since Sue only amplified the main traits of the geology of the AltaiSyndes he had identified, namely 1) the predominance of slates and schists, locally interleaved by diabases and serpentinites, intruded by granitoids and gabbros, and overlain by their volcanic equivalents, 2) a complex structure characterized by intense folding and faulting with dominant vergence away from the Angaran craton (with numerous thrusts: Fig. 2), 3) map-view disposition of large-scale structures in arcs generally convex away from the Angaran craton, 4) generally decreasing ages of deformation away from the Angaran craton, and 5) absence of narrow orogenic belts squeezed between well-defined fore- and hinterlands.

**ALTAIDS AND TURKIC-TYPE OROGENY**

My interest in the geology of Central and Northern Asia was

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**Figure 2. [see opposite page] Generalised tectonic map of the AltaiSyndes.**

This map is reproduced from the manuscript by Şengör, Natal’ lin, and Burtman submitted to Nature (see end-note 13 below) and shows the first order tectonic units, the pre-Altai syndenial fragments, Altai accretionary complexes, and Altaid magmatic fronts. The combined magmatic fronts carry only the symbols representing the earliest and the latest activity. Along the strike-slip faults only the major Altai displacements are indicated, although many of these faults later had motion along them, commonly in an opposite sense. The first-order Altaid units are the following (for the details of their stratigraphy and general structure, see Şengör, Natal’lin, and Burtman, submitted):

kindled when I was working on the geology of the Asiatic Tethysides. In eastern Tibet a vast triangular area, known as the Songpan-Ganzi System, consists over 95% of early Triassic rocks, indicating that over two in three places where there base can be seen, Permian deep-sea deposits. By 1980, it was clear to me (Şengör, 1981) that here one was looking at a huge early Triassic subduction-accretion complex, that probably partly still was underlain by oceanic crust (if this term is still meaningful beneath some 40 to 50 km. of sedimentary rock piled up into an immense plateau). It had accumulated partly in front of the Kuen-Lun mountains in northern Tibet and southern Xinjiang (Şengör, 1981; Şengör and Hsiü, 1984). My search for the northern margin of the Palaeo-Tethys thus led me into the geology of the Kuen-Lun mountains. It is here that I realised that the Kuen-Lun itself was an earlier, Palaeozoic part of the Songpan-Ganzi system. The whole mountain range consisted of steeply dipping schists, locally intercalated with disrupted ophiolites and intruded by subduction-related granites of various ages (Şengör and Okurügulları, 1991). It became clear to me that the style of orogeny I was looking at in the Kuen-Lun was not a common one in the Tethysides, its rather insignificant representatives being known from the Cainozoic of eastern Turkey (Şengör and Yilmaz, 1981) and the Makran of Iran and Pakistan (Farhoudi and Karig, 1977; McCull and Kidd, 1982). By contrast, orogenic belts dominated almost exclusively by highly deformed and upturned schist packages representing former deep-sea deposits, turbidites and intruded by arc plutonics were a commonplace occurrence around the Pacific, especially in the western North America, Alaska, Japan, and New Zealand. Very large accretionary complexes representing the subduction-accretion wedges, with widths on the order of many hundreds of kilometres (Alaska, Makran, Barbados) were the main building blocks of the orogens from the western US to New Zealand.

In southern Japan Matsuda and Uyeda had already noted in 1971 that the subduction-related magmatic front there had not been stationary since the Mesozoic but had migrated oceanward into the growing accretionary complex. Elsewhere episodic ridge subduction also contributed to the magmatic history of accretionary wedges and also, locally, brought about widespread HT/LP metamorphism that in places rose to granulite grade (e.g. in the Chugach Mountains of Alaska: Plafker et al., 1989).

None of this was known from the "classical" orogenic belts of the Tethysides, or from others in Europe and eastern North America, where the dominant international tectonic biases had been nurtured since the late eighteenth century. The Kuen-Lun thus appeared, together with the Songpan-Ganzi system, as an anomaly in the structure of the Tethysides. As Argand so prophetically observed in 1922, the Kuen-Lun was a "Circum-Pacific" orogen caught up in the Tethyan collisional system (Argand, 1924, pp. 243-244 and 299). The question then naturally arose as to where the boundary between these two fundamentally distinct architectural styles in the structure of Asia passed and what its significance was.

In Şengör (1992b) I answered this question: "the Kuen-Lun style" characterised all orogeny in Central and Northern Asia since the late Proterozoic north of the Palaeo-Tethyan suture in the Tethysides and north of the North China craton farther east (mainly north of the Permian Suelun-Xilamulun suture: Wang and Liu, 1986; Hsiü et al., 1991). Thus the eventually collisional latest Proterozoic and Palaeozoic orogens of Northern and Central Asia were all like the Kuen-Lun, i.e. like the circum-Pacific chains and not similar to the Alps or the Himalaya of the Tethysides.

Since not all circum-Pacific orogens display the same style (the internal structure of the Central Andean orogens looks nothing like the Kuen-Lun), I decided to use a local Asiatic name to designate the style of orogeny encountered in the Kuen-Lun and farther north in the Tian Shan, Ural, Kazakhstan, Altay, and Mongolia. Almost without exception, these mountain ranges are located in areas where some Turkic branch of the Altai language family is spoken (e.g. see Jarring, 1961; Farquhar et al., 1967). I accordingly named this style the "Turkic-type" and contrasted it with the Alpine- and Himalayan-types (Şengör, 1991,1992b). Suesh had named Altoids "a system of mountain folds that comprises the main portion of Eurasia extending from the Vertex... through the central part of Asia to the mountainous plateau of Tibet" (Suess, 1929, p. 351). Although Sues' Altoids extended all the way to Southeast Asia in the east and to the Appalachians in the west, our present understanding of the structure of Eurasia has made it desirable to limit the term now to its original core region. In my 1987 review of the structure of Asia, I defined the Altoids as those mountain ranges that surround the Angaran craton and whose outer limits are set by the East European Platform in the west and the southern boundary thrusts of the Tian Shan in the south. This definition still holds, but the new interpretation of the Altai evolution presented below has necessitated diminution of the Altai system by excluding the Ural west of the Valenianov volcanic arc just east of the Oktabysr-Denisovsky suture (heavy discontinuous line east of Mugodzhar in Fig. 2: cf. Zonenshain et al., 1990).

It is thus seen that almost the entire Altoid system represents a collage of Turkic-type orogens arranged like a necklace around the western and southern boundaries of the Angaran craton (Fig. 2). In a recent study in conjunction with Boris A. Natal' in and Valentin S. Burtman3, I and my co-workers have distinguished 24 main units within the Altoid edifice on the basis of their palaeotectonic behaviour during the Palaeozoic. Below I summarize how these units were distinguished. The lessons we learn from the Altoids would be equally applicable to all orogens of Turkic-type, e.g. the Pan-African basement of northeast Africa and Arabia and many Precambrian orogenic belts.

HOW TO DEFINE THE FIRST-ORDER TECTONIC UNITS IN TURKIC-TYPE ORGENS IN THE ALTAIDS

The monotonous triplet consisting of basalt, chert, and turbidite dominates the lithic content and the nearly chaotic penetrative internal architecture of subduction-accretion complexes, making it extremely hard to find markers in them by which to outline their large-scale structures. This long has been a serious problem in the Altoids hindering understanding of their large-scale structure. To define and trace the lateral continuity of large palaeotectonic units in the Altoid architecture, I and my co-workers used magmatic fronts of former magmatic arcs as structural markers. Such fronts are very sharp, they are temporally persistent on a scale of tens of millions of years, and they must be continuous along subduction fronts (Spiegelman and McKenzie, 1987; Şengör
et al., 1993). In our map (Fig. 2), we united Vendian-Palaeozoic subduction-accretion complexes (there is some Triassic solely in the eastern end of unit 23.4) into a single category, which we then subdivided into three subunits according to minor fault age of accretion as indicated by the age of unconformable forearc sediments and/or igneous rocks intruding them (Fig. 1). The only other area we defined in the Altaiids to delineate their first-order structure is fragments of pre-Altaiid continental crust within the Altaiid collage. Invariably, such pieces were seen to have constituted arc massifs forming primary backstop to the large Altaiid subduction-accretion complex. Inside the accretionary complexes, we noted the structural vergence developed during accretion ("structural vergence" in Fig. 2) and used this as a further criterion to establish subduction polarity in addition to the facing of magmatic fronts and contacts between arc massifs and accretionary wedges.

We noted as possible strike-slip boundaries major steep, laterally persistent, straight or gently curvilinear faults along which whole units are truncated and along them we then searched systematically for displacements. We also compiled accounts of attitudes of stretching lineations within mylonite zones along such faults. These accounts, combined with extremely wide mylonite zones and steep fold axes, we employed to underpin our inference of strike-slip. As some former strike-slip faults appeared to have suffered significant later oroclinal bending and more complicated folding around vertical axes, their identification became an iterative process, proceeding along with palaeotectonic reconstructions. We also took note of post-Altaiid offset reversals of some of the big strike-slip faults we identified. These later offsets are well-known in the literature, both local and international, and I do not need to discuss these any further here.

Once the palaeotectonic units were identified, their evolution during the course of the Palaeozoic became an easy problem to tackle, particularly owing to the constraints provided by the palaeopositions of the bounding cratons of "Baltica" (the early Palaeozoic continent including the East European craton) and "Siberia" (the early Palaeozoic continent including the Angaran craton).

**TECTONIC EVOLUTION OF THE ALTAIDS**

In the following account, all geographic directions refer to the reconstructed geographies depicted in Fig. 3.

The tectonic evolution of the Altaiids commenced following the Riphean-Vendian collisions of the Baykalides around the Angaran craton and the pre-Uralides along the (present) eastern margin of the East European craton. Although this sounds like a clear-cut delimitation, the Baykalide-Altaiid transition is not everywhere well-defined. It appears to be best defined in the southern Ural, where the pre-Baykalide deformations were followed by a period of erosion that then was followed by latest Cambrian-earliest Ordovician rifting. The problem in the Ural is that we do not know what rifted and where the rifted fragments went. Contrary to conventional wisdom, the rifting that led to the Sakmarian-Magnitogorsk basins looks like rifting of a single back-arc basin above a Eurowepend-dipping early Palaeozoic subduction zone and consequently says next to nothing about the main Uralian tectonic zones, including the Varianov magmatic arc farther to the east. I assume that the object rifted was continental, for the latest Cambrian-earliest Ordovician rifting in the southern Ural looks like intracontinental rifting (see Zonenshain et al., 1984). Until more data are obtained, I simply follow the interpretation of Zonenshain et al. (1990) and identify the rifting fragment with the Mugodzharc of the southern Ural, whereby under the designation of "Mugodzharc" I combine not only the Mugodzharc uplift of Zonenshain et al. (1984), but also their Trans-Uralian uplift and the Irgis "synclinorium". Available observations from the southern Ural are consistent with the interpretation that these units are nothing but repeated segments of one and the same ensialic arc, repeated along (7-left-lateral) strike-slip faults.

The most important initial boundary condition of the Altaiid tectonics is the hypothesis that Baltica and Siberia may have been united with one another along their present northern boundaries "head-to-head" like a pair of Siamese twins during the Vendian. Available palaeomagnetic data seem permissive of placing the two cratons as shown in Fig. 3A (see McKerrow et al., 1992; Torsvik et al., 1992). Late Vendian separation of Baltica from Siberia is suggested in northern Europe by the 600+ Ma dykes in Finnmark (Beckinsale et al., 1975) and in the northern Kola Peninsula (Lyubutsov et al., 1991) and widespread Vendian diamicitte deposition and volcanism in tectonically mobile basins (see the various papers in Hambrey and Harland, 1981). Their Siberian correlatives are probably found in the poorly-dated pre-Cambrian ?latest Riphean-Vendian rift sediments of the Taymyr peninsula whose ages recently have been reduced to become closer to their European counterparts (Khain, 1985).

The united Baltica/Siberia apparently had an active eastern margin underlain by the Riphean/Vendian pre-Uralide collisional orogen to the east of Baltica and the Baykalide collisional orogen to the east and north of the Angaran craton of Siberia. The Baykalide collisions may in fact have caused the onset of the subduction along the seadside margin of the collided fragments, although to the east and northeast of unit 23.1, Vendian subduction continued into the Palaeozoic, directly linking the Baykalide with the Altaiid evolution.

During the Vendian, parts of this marginal orogenic belt began to separate from the united Baltica/Siberia. Rifting of this age is documented in the units 1, 2, 3, 5, and 7 (Figs. 2 and 3A). The conjugate Baltica/Siberia margin contains comparable evidence in the Northern Ural. Also, a line of "Riphean to Palaeozoic riffs" with Vendian-Cambrian graben facies characterizes the present western boundary of the Baykalides in the basement of the West Siberian basin (Surkov and Jero, 1981; Bochkarev and Kirinichkin, 1988). This rifting event became younger southwards in the direction of the present southern Ural, where it occurred at the Cambro-Ordovician boundary.

My co-workers and I called the fragment thus rifted away from the united Baltica/Siberia the Kipchak Arc, after the former aboriginal population in the region of the present distribution of its fragments. Until the Devonian it bowed away from the two cratons with a free end at its southern tip, although its northern end appears to have remained attached to Siberia, where the early Palaeozoic accretionary complex in units 8, 15, and 16 is larger than in other parts of the Kipchak Arc (Fig. 3B). The Kipchak Arc accretionary complex became progressively smaller towards the southwest away from its major source in Siberia and probably
Figures 3a and 3b (3a is on the opposite page). Schematic and simplified palaeotectonic sketch maps showing the evolution of the Altaiids. The reconstructions are copied from the submitted manuscript of Şengör, Natal'în, and Burtman:

A- Vendian-Cambrian, B- Middle Silurian (Wenlockian), C- Early Devonian (Emsian), D- Late Devonian (Famennian), E- Early Carboniferous (Namurian), F- Late Carboniferous (Westphalian), G- Early Permian (Artinskian), H- Late Permian (Kazanian). The "error" in Figure 3G is the difference in the position of Baltica in our reconstruction and that of Scotese and McKerrow (1990).
resembled the present Aleutian accretionary complex. We called the ocean that opened behind the Kipchak arc the Khanty-Mansi ocean after the aboriginal population of northern West Siberian basin. At this time the Sakmar/Magnitogorsk marginal basin in the southern Urals was continuing to open behind the migrating Mugodzharc arc.

The enlargement of the subduction-accretion complexes in front of the units 2, 3, 4, and 5 stopped by early Devonian time (Fig. 3C). We have interpreted this as a consequence of lateral stacking along their bounding strike-slip faults as suggested in Fig. 3C. This may have occurred as a consequence of the collision of the southern tip of the Kipchak arc with the Mugodzharc arc as hinted at by the sudden influx there of considerable early Devonian clastics simultaneously with the diminution of the subduction-related magmatism. Subduction probably was interrupted under the part of the Kipchak Arc now represented by units 1 and 3 at this time as suggested by the configuration shown in Fig. 3C and indicated by the absence of subduction-related magmatism, sedimentation, and deformation of this age in these fragments. By contrast a Devonian subduction-accretion wedge began growing to the north of the units 6, 7, and 8. The Devonian magmatic front migrated in these fragments onto the enlarged subduction-accretion complex and converted them into "arc massifs".

At this time, oblique southwest-directed subduction was going on along southern Mongolia and the Altay mountains. The oceanic recess between unit 23.1 and the Angaran craton, lined by the Western Sayan arc (unit 21.3), had closed by tightening of the recess and pinched the Western Sayan arc into a hairpin by the late Silurian (Figs. 3B & C). The tightening was probably brought about by an eastward movement of the unit 23.1 that dragged along some of the ophiolites belonging to the Western Sayan arc and created the Oka-Jedinsk zone (unit 22; Fig. 3C). The Anuy-Chuya fragment (unit 16) of Cambro-Ordovician subduction-accretion complex bypassed the West Sayan pinching and got emplaced against the Barmaul unit (no. 17) through right-lateral strike-slip faulting. This episode of strike-slip faulting led to further strike-slip stacking and associated rifting within the "comb of Altay" (Fig. 2) and generated much alkaline volcanism in the Minusinsk basin complex.

By the late Devonian (Fig. 3D), the Kazakhstan orocline moved left-laterally along the Kaindi Atasu relative to its present southwestern flank leading to arc magmatism along the present northeastern front of the Atasu-Mointy fragment and may have also began to be internally disrupted by strike-slip faults parallel with the Kaindi Atasu as indicated by the medial Devonian alkaline intrusives at least along the boundary between the future units 7 and 8. A considerable accretionary complex had grown inside the Kazakhstan orocline by this time into which the late Devonian magmatic front migrated. Within the older subduction-accretion complex, across which the magmatic front had migrated, the intrusion of high-K granites in the retroarc area and the deposition of shallow marine sedimentary rocks in the forearc region suggest that a near-normal thickness continental crust probably was generated here by subduction-accretion and arc magmatism (Șangőr, and Okuroğullari, 1991).

The convergence of Baltica and Siberia by the subduction of the Sakmar/Magnitogorsk, Khanty-Mansi and the Turkestanian oceans in the early Carboniferous (Fig. 3E) gave rise to transpressional slip of the tip of the Kipchak arc to the north and caused the recommencement of subduction under its segment now represented by units 1 and 2. Ongoing oblique subduction in southern Mongolia and the Altay placed the Gorny Altay (unit 15) against the Delyun-Saksai (unit 21.2) Devonian accretionary complex and thus brought its growth to an end. It was probably also by this time that the Kazakhstan orocline had begun tightening by internal strike-slip faulting separating the Tengiz, Kalmyk Kol-Kokchetav, and the Yerentau-Chingiz-Tarbagatai (units 6, 7, and 8, respectively) from one another.

By late Carboniferous time Baltica had begun transpressing with respect to Siberia in a right-lateral sense (Fig. 3F). This both tightened and transported westward with respect to Siberia the entire Kazakhstan orocline plus unit 1 thus continuing the right-lateral shear along the Altay-South Mongolian area. Both the Rudny Altay-Kolyvan unit (no. 14) and the combined Zharma-Saur, Tar-Muromtsev, Surgut units (nos. 11, 12, 13, respectively) moved west with respect to the rest of the comb of Altay. This movement lasted into the early Permian (Fig. 3G) and rifted the Nurol basin (unit 25) as a pull-apart basin and led to alkaline magmatism in its basement.

The final stage of the Altaid evolution during the Palaeozoic was a reversal of the shear sense between Baltica and Siberia (Fig. 3H). This reversal was accompanied by stretching across the future West Siberian basin as Baltica and its appendage west of the Gornostave shear zone moved east and south with respect to Siberia. It carried the arc fragments of Zharma-Saur (unit 11) and Tar-Muromtsev (unit 12) eastward with respect to Siberia and juxtaposed them against the Carboniferous flysch deposits of unit 13 in the Zaysan suture zone. A part of this transtensional regime was responsible for rifting the Nadim, Alakol, Juggar, and the Turfan extensional basins, before the last three were affected by late Triassic shortening caused by the Cimmeride collisions far to the east. The same kinematics gave rise to collision in the Taymyr and continuing subduction along the Alazeya arc behind the Verkhoyansk belt in northeastern Siberia and may have triggered the onset of the Tunguska trap eruptions.

CONCLUSIONS

The Palaeozoic evolution of the Altaid orogenic collage in Asia is the history of the formation, development and disruption mainly by strike-slip faulting, and final amalgamation into a complex orogenic collage, of the Kipchak and the Mongolian/Altay arcs. The Kipchak Arc originally rifted from a united Baltica/Siberia continent likely by back-arc spreading processes.

The tectonic evolution we see recorded in the Altaid orogenic collage was similar to that which characterised the tectonic evolution along the North American Cordillera, and especially in Alaska, during the Mesozoic and early Cenozoic. An aspect of central importance was the formation of huge accretionary complexes along the Altay-Mongolian and the Kipchak Arc margin. Although these complexes contain, in addition to large sedimentary piles and shreds of former oceanic crust and mantle, former guyots and possibly remnants of past oceanic plateaus, they do not form from amalgamation of large, distinct buoyant entities such as microcontinental fragments or island arcs. They are strictly
subduction-accretion complexes or accretionary prisms in the sense of Karig and Sharman (1975). The total area now occupied by these complexes within the Altaiids is some 5.3 million km², i.e. about 1/9th of the entire surface of Asia. During the ca. 350 million years of Altaiid evolution, an area slightly larger than two soccer fields thus was added to Asia every year! Howell & Murray (1986) estimated that 1.30 km³ of sialic material leaves the mantle every year and some 1.70 km³ is brought into subduction zones from terrigenous, pelagic, and biogenic sources. Thus, of the total accreted to the continents, about 45% is of juvenile and 55% is of exogenically recycled sources. If this ratio has remained roughly the same since the beginning of the Phanerozoic, some 0.205 km³ of juvenile material must have been added annually during the Phanerozoic to the continental crust along the Altaiid subduction systems. Dewey and Windley (1981) have estimated that during the Mesozoic-Cenozoic, the net growth rate of the continental crust has been 0.429 km³/ya. If this was so also for the Phanerozoic, it suggests that the Altaiid subduction systems may have contributed nearly 48% of the world total of new continental crust during the Phanerozoic. This suggests that much of the new continental crust in the Phanerozoic was made in a relatively localised area, as it is today in SE Asia.

One other aspect of the Altaiid accretionary wedges deserves attention. They are made up mostly of turbidites and the percentage of ophiolites and pelagic oceanic sediments rocks in them is insignificant. Le Pichon and Henry (1992) have related the accretion of sediments at trenches to the presence of a significant thickness of coarse terrigenous, high permeability sediments on top of fine, pelagic, low permeability sediments. Thus the presence of a trench fill leads to accretion and the existence of accretion stiles erosional (i.e. tectonic erosion at subduction zones) processes. Le Pichon and Henry (1992) conclude that subduction-accretion must have been maximum during the Pleistocene glaciation owing to lowered sea-level which must have favoured increased terrigenous sediment influx into trenches.

If this is so, then one would expect minimum subduction-accretion in the Mesozoic on the premis that no major continental glaciations happened and sea-level was consequently high, discouraging much terrigenous influx except near high mountain ranges such as the Cimmerides and the Cordilleran ranges from Alaska to the Andes. Indeed the Phanerozoic marine ⁸⁷Sr/⁸⁶Sr evolution curve shows that the riverine input of Sr into the world ocean was at a minimum during the Mesozoic and the early Palaeogene (see Burke et al., 1982 and Richter et al., 1992). It seems as if glaciation, by controlling sea-level and terrigenous sediment supply into the world ocean and thus into trenches, may be one major control on the rate of continental enlargement and even growth. This may explain partly the episodic growth of the continental crust and why the Phanerozoic Altaiid growth was so spectacular.

Our study of the Altaiid collage was undertaken in a "jumpers" mood, i.e. by attempting to form as large units as possible. We tried to erect units that we could follow through the entire system to be able to track its development and changes in shape through time. That is why we used the magmatic fronts as structural markers. We also wanted to create genetic units, whose history would yield the tectonic evolution of the Altaiid collage.

This approach bore the fruits, which I presented above. It is very different in character from the results of the North American "terran analysis" as our approach was very different from that of the terranologists. When we began our work, we assumed that we were looking at subduction accretion complexes in the Altaiids. Our assumption was based on our previous knowledge of the rock types and structures present in the Altaiid system. We further assumed that these subduction accretion complexes would have faced in the direction of their younging and behind them they would have to have backstops. We thus deliberately did the opposite of what terran analysts would recommend: we began with assumptions on the tectonic nature and on the spatial relations of our units. The paper by Şengör, and Okuroğulları (1991) represents the first iteration in this thinking process. The model presented there very successfully accounted for the general style of orogeny in the Altaiids and for the details of

Figure 4. [See left] Two iterations of the evolutionary model of the Kazakhstan orocline.

A. Şengör's original proposal developed from the model presented in Şengör and Okuroğulları (1991) and in criticism of the ad hoc model in Zonenshain et al. (1990).

B. Şengör's revised proposal after the falsification of the model in A by Burman and after Natal' in's simpler model for the nature of the pre-Altaiid continental pieces within the Kazakhstan orocline. Note that the model in B explains the presence and nature of the Nikolaev Line, a feature not originally intended and not explicable by the model in A.
their middle to late Palaeozoic evolution. Although its prediction of the nature of orogeny for the early Palaeozoic was correct, it failed to account for important details such as accretionary vergence and arc facing. Şengör and Okuroğulları’s model failed completely in its treatment of the pre-Altaid continental fragments. Although some, such as Kokchetav and Ulutau, it interpreted correctly as backstop to subduction-accretion complexes, smaller ones now embedded within the subduction-accretion complexes, such as Yerementau and Aktau-Mointy, it misinterpreted as independent microcontinents that had been swept into the subduction-accretion complexes.

When our work commenced, Şengör made the assumption that the model of Şengör and Okuroğulları (1991) also applied to the early Palaeozoic tectonics and that the Kazakhstan orocline was connected with the Valerianov unit in the Ural through a simple orocline (Fig. 4A).

Boris A. Natal’iın criticised the simple orocline hypothesis for Kazakhstan and showed that all the pre-Altaid fragments can be interpreted as backstop fragments, still attached to parts of their original accretionary complexes, displaced along large strike-slip faults. He further showed that there had occurred an important flip of vergence and arc facing in the fragments now found in the western and southwestern flank of the Kazakhstan orocline. This did not at all fit into Şengör’s original conception of a simple double orocline in the Kazakhstan–Tien Shan system (Fig. 4A). Moreover, Burtman, working on the Tien Shan and the Valerianov area pointed out a space problem that resulted from Şengör’s model: If the simple double orocline was to be maintained, subduction between the Valerianov and Kazakhstan (line A-B in Fig. 4A) was a necessity, which was absurd. Everybody who worked on the Valerianov and Kazakhstan knew that they had a common Devonian red bed cover and no oceanic boundary could be introduced between them, thus inescapably falsifying Şengör’s model.

Şengör then made a suggestion that kept both the Kazakhstan orocline and the east Tien Shan orocline “in principle” as shown in Fig. 4B. This model agreed well with Natal’iın’s observations of the early Palaeozoic structure of Kazakhstan and also accounted for Burtman’s space problem. A consequence of this model was that it unexpectedly accounted for the Nikolaev Line in the Tien Shan, which had not been foreseen. It also predicted what the geology beneath the Ishim basin ought to be like, which was immediately corroborated by checking the data reported in Surkhov and Djerio (1981).

But the greatest success this method yielded was in the prediction of the structure beneath the West Siberian basin. It not only accounted for the distribution of the rock types, structures and age provinces, but it also predicted Permian extension in the basin. Where we predicted on the basis of the Altaid kinematics alone that there should be a basin between our units 13 and 14 under the West Siberian cover, Natal’iın later found in the literature late Palaeozoic alkaline basaltic dykes and sills in addition to the large sediment thicknesses and reduced crustal thickness. Also our late Permian kinematics unexpectedly predicted a phase of major extension in the Alakol, Junggar and Turfan basins, which the Chinese geologists had locally documented and both Prof. Kenneth J. Hsü of the ETH-Zurich and Dr. Mark B. Allen and Prof. Brian F. Windley of the University of Leicester long had suspected to have been widespread in the area.

The above examples show the success of a model-driven trial-and-error method in disentangling the structure and evolution of large orogenic collage. This critical rationalism method stands in stark contrast to the sterile, existential recommendations of the terrane analysis (e.g., Howell, 1989), which I elsewhere, and on other examples, argued to be a retrogressive step in the analysis of regional tectonics (Şengör, 1990b; Şengör and Dewey, 1950). This "Popperian critical rationalism" has been shown to be of general applicability to other earth science problems as well (e.g. Haines-Young and Petch, 1986), showing that science is not a passive process of information accretion, but one of active interrogation of nature.

I end this lecture with a quotation from Argand’s immortal work, in which the relationships between a geologist and his object of study is best expressed (Argand, 1924, p. 329):

"What else should I say? We have questioned all of Asia, and she has responded rather generously; she has informed us of other lands, and there are few she does not help us to understand better. We have reached in the end the Japanese islands, which are nobly curved as if bent over the secret of the waters. Let us rest in these well-built lands where each morning the rising sun begins to light up Eurasia. The Fuji at dawn announces the glory of the day to come. From the depths of the blue immensity, waves rise, break, and thunder; they tell of the beautiful fugacity of appearances, of the measured equilibrium of things. Under our feet, less agile, waves crowd themselves in the black depths. Far away, behind us, as far as the heart of the continent, other and still other waves, exhausted by time, concealed in the splendid torpor of the old chains, are reanimated through the immense efforts of the heavy basement waves. This is how in the course of time wavering veils concealed the old heart of the world. The waves pass and as in the old dreams of Asia they all together tell of the evanescence of the universe. How many times did the sun shine, how many times did the wind howl over the desolate tundras, over the bleak immensity of the Siberian taigas, over the brown deserts where the Earth’s salt shines, over the high peaks capped with silver, over the shivering jungles, over the undulating forests of the tropics! Day after day, through infinite time, the scenery has changed in imperceptible features. Let us smile at the illusion of eternity that appears in these things, and while so many temporary aspects fade away, let us listen to the ancient hymn, the spectacular song of the seas, that has saluted so many chains rising to the light".

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Brian F. Windley, and Drs. Trond H. Torvik, W. Stuart McKerrow, Harold G. Reading, and Mark B. Allen contributed data and discussion at various stages of our work. Because this work is going to be reported elsewhere in full, my references to the mammoth Russian work of the last two-and-a-half centuries on the Altaids has been scanty. I here take the opportunity once more to acknowledge that monumental effort, without which our work on the Altaids would not have been possible. The dedication placed at the head of the text is only a feeble expression of my boundless admiration and gratitude for the magnitude and the quality of the Russian work on the Altaids.

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Wang, Q. and Liu, X. 1986 Paleolatplano tectonics between Cathaysia and
NOTES

1. This influence is most vividly seen in the only maps we acquired from Antiquity, namely those of Ptolemy and the Roman road map preserved in the Peutinger Table (cf. Tooley, 1987; for a discussion on the authenticity of Ptolemy’s maps, see Fischer, 1932, who argues for authenticity, Dilke, 1985, noncommittal, and Szegi, 1987, who argues for non-authenticity). I incline to the authenticity of at least the world map on the basis of the poorly-dated testimony by Agathodaimon (Dilke, 1985). For two easily accessible reproductions of Ptolemy’s maps see Stevenson (1932: *Codex splendissimus latini Ebnerianus* in the New York Public Library containing maps drawn by Nicolaus Donis), and Pagani (1990: *Codex Latinus V. F. 32* in the Naples National Library, with maps attributed also to Donis by J. Fischer). For the most widely-known printed editions of Ptolemy’s maps (mainly based on Donis’ work and printed in Rome beginning with 1478), which most profoundly influenced the post-Renaissance image of mountain chains in the Europeans’ minds, see the facsimiles in Nordenskiöld (1899). Both the European (e.g. Harvey, 1991) and the Arabic (e.g. Szegi, 1987) Medieval maps show mountains in the tradition of Eratosthenes, i.e. as long and narrow strips, although not always straight. Schmaler (1904) presented a most convenient summary of the evolution of thought on the mountain-structure of Central Asia from Antiquity to the middle of the XIXth century, in which one sees how, despite the concept of “High Tatra,” long and narrow mountain “lines” have dominated thought to Alexander von Humboldt (compare the map in de Humboldt, 1831, v. 1, with the reconstruction of Eratosthenes’ Taurus to appreciate how little the progress had been between the two despite the intervening two millennia!). Baron von Richthofen’s maps of the mountain ranges of Central Asia in his epochmaking *China* (von Richthofen, 1877, plate 3) shows that the same remained true till the publication of Suess’ views, as I shall show below. See also Sven Hedin’s great work on the history of exploration and evolution of thought on the mountain-structure of Tibet and surrounding regions (de Margerie, 1929, and the full references therein). As an aside, I wish to underline how strongly our ideas on the origin of topographic entities influence the way we see them, as the depictions of mountains through the ages show.

2. Von Humboldt added some of his own observations during a research trip he undertook upon the request of the Imperial Russian Government between 12th April and 28th December, 1829 to the mountains of Western and Central Asia. For this fruitful journey, see Kletke (1856) and von Humboldt (1869). The scientific results were summarised in von Humboldt (1831 and 1843).

3. In his account of the rocks of the Russian Altay, (the ”Lesser” Altay) von Humboldt repeatedly emphasizes the extreme paucity of gneisses and the dominance of not only slates but also various kinds of schists (see von Humboldt, 1845, esp. pp. 286-314). He underlines the occurrence of granite “in the interior of the schistose region” (p. 294). Also see von Cotta (1871) esp. pp. 72ff: “The main corpus of the Altay consists of crystalline schists and parascists with various subordinate interlayers, cut by widespread granite masses and dykes which are all older than the Permian.... The crystalline schists of the Altay consist dominantly of the varieties of mica schist, which in places passes into chlorite schists, talc schists and hornblende schists, with interlayers of quartz schists and granular limestone. Gneiss occurs only as a foliated variety of the granites.” (p. 72).

4. See also von Cotta’s remark about the greenstones in the Altay in the quotation given in footnote 3 above.

5. I give only the Löwel reference here, for many of Sues’s’ fiercest critics later, such as Tietze, Stille, and Haarmann used Löwé’s book to attack Sues’ view of mountain-building. Only now do we begin to appreciate the incredible appositeness of many of Sues’s similes that he used to elucidate his view of orogeny and how shallow by comparison his opponents’ understanding of the structure of the world’s mountain ranges was!


7. Wilson’s paper is a most amazing document, for, plate tectonics aside, presents a view of crustal development indistinguishable from those now current including the growth of Archaean nuclei by island arc formation and amalgamation of numerous arcs. Wilson only missed the importance of accretionary wedges, simply because his (then) fixed contractionist tectonic model did not allow him to grow accretionary complexes in the way that Argand earlier had been able to. Wilson considered the fundamental basis of his model the concentration of deformation at any one time in narrow, mobile belts, “one of the great achievements of field geology” (Wilson, 1954, p. 152). Little did he realise that he was standing on the shoulders of Eratosthenes! This Eratosthenian bias that Wilson nurtured later helped him to formulate plate tectonics (see Şengör, 1990a).
8. It is impossible to do justice here to the immense amount of work done by Russian geologists of many generations in Northern and Central Asia. Commonly spearheading exploration efforts into the vastness of Asia, these men had among them such legendary names as Tchihatcheff, Prjevalsky, Koslov, Bogdanovich, Techersky, Kropotkin, Mushketov, Obruchev, and numerous others also in this century who engraved their names in gold into the history of our science. In the nineteenth century, the geological exploration of Northern and Central Asia was much aided by the discovery of rich mineral resources (especially gold and coal) and the construction of the Trans-Siberian Railroad. Suess (1901) presented a monumental summary and synthesis of this work. A more concise, but inevitably less complete summary (with a useful map of the explored areas) is in Comité du Chemin de Fer Transsibérien (1900).

9. A preliminary Russian and English bilingual version of this 1980 publication was mimeographed and distributed during the 25th Session of the International Geological Congress in Sydney in 1976 (Peive et al., undated). In that work all the main ideas contained in the 1980 explanatory text were already present, although very few people are likely ever to see that little-circulated text.

10. The Russian Altay is likely the first region in the world in which significant thrust faulting was observed and correctly interpreted. B. F. Hermann reported in his books published in the last quarter of the 18th century, that granite was “pushed up onto the schists” along the right bank of the Irtysh, just below its confluence with the Narym. See Suess (1901, p. 205 and p. 253, note 24) for the controversy and the rich literature on this subject. Also see von Humboldt (1843, p. 306-307, and note 2 on p. 306), which Suess does not cite.

11. Both Prof. Brian F. Windley and Dr. Mark B. Allen expressed concern that the designation "Turkic-type" was likely to cause confusion, for many geologists may not necessarily be aware that vast parts of Central and Northern Asia are inhabited by Turkic peoples and consequently they would search for the type locality of the Turkic-type orogens in the present-day Turkey, where it exists only in a small area in eastern Turkey, the rest of the country being taken up by Himalayan-type orogens (cf. Şengör and Yılmaz, 1981, and Şengör, 1992b). I believe that this danger is indeed present, but, after the disintegration of the Soviet Union, has been getting less and less significant not the least because of the increasing media coverage of the Turkic republics. I shall continue to use this term, until someone else offers a better alternative.

12. This definition was taken from a paper by Suess’s son, F. E. Suess. I give here this definition also, because it is much more succinct and clearer for beginners than the long and diffuse presentation Suess himself gave in the Face of the Earth (Suess, 1901, p.250) which I already quoted above.

13. This study was undertaken in the framework of the Altai Project under the auspices of the GloTek (Global Tectonics Research Unit) in the Department of Geology of the Faculty of Mines of the Istanbul Technical University, supported by the Turkish Council for Scientific and Technological Research (TUBITAK). The formal presentation of our results, with full documentation of our data sources will be published elsewhere. A preliminary note by Şengör, Natal'ın, and Burman was submitted to Nature on 5th March, 1993 (and is now in the press). The sections of the definition of first-order tectonic units within the Altaids and tectonic evolution, plus figures 3 and 4 in this paper incorporate parts of that preliminary note and its figures 2 and 3. See also the acknowledgements at the end of this paper.

14. I use the names “Baltica” and “Siberia” very reluctantly and only because they have been so entrenched by the publications of the Chicago and the Oxford groups in the new literature on continental reconstructions. My reluctance stems from the inappropriateness of the names. “Baltica” and “Siberia” call to mind geographical entities not nearly coincident with the former continents to which the names refer (especially when one remembers that Siberia originally referred to regions immediately east of the Ural, after the Sibir Khanate centred on regions around the confluence of the Irtysh and the Ob!). Both Finno-Sarmatia and Angaria had been used in the past for these former continental entities and they would have been much more appropriate for Baltica and Siberia, respectively. Also some continuity with the already proposed terminology needs to be preserved, lest we create a very rich and precise, but unlearnable language with no mnemonic devices to aid memory for palaeotectonic and palaeogeographic studies.

15. The way I use Mugodzhar seems in line with the earlier usage of its predecessor, the Kara Edir Tau, that included everything to the east of the Magnitogorsk unit. See von Humboldt (1831, v. I, map).

16. Many great geologists in fact preceded Popper in propounding a critical rationalist trial and error methodology in tectonics. See Şengör (1990) for a thorough discussion.

Note added in proof: While this paper reached the proof stage, the name of the Arkalik Fault had to be altered to Kaindi Atasu fault to prevent overlap with a previously-named Arkalik fault within the Altain collar. I would kindly ask the readers to make the corresponding alteration.
ANNUAL REPORT AND PROGRAMME FOR THE 150th SESSION 1992-1993

PRESIDENT’S REPORT

In presenting my report for the 1992-3 session I would like first to record my sincere thanks to the Society for honouring me with the Office of President and also for doing it at a time when I have been able to give the responsibility very largely undivided attention. I have therefore enjoyed my year of office. In no small measure that has been made possible by the support which I have received from the Officers and Council to all of whom I extend my gratitude.

In particular I must thank our Programme Secretary, Hilary Lewis, for the excellent work which she has done in providing us with such a varied and stimulating programme of lectures. I realise that this is a joint appointment with her husband but week by week experience has shown me just how much Hilary has contributed to the smooth and efficient way in which our meetings have been arranged. My impression is that the range of subjects addressed over the session has been very varied and, to my own personal delight as a student of history, she has included no less than four lectures within this area.

Throughout the session I have been aware of the difficulty which some of our members experience in hearing our speakers both in general terms and also by means of the loop system. The Museum has purchased a new lapel microphone which is working well, but some speakers do not always use it efficiently. I can only say that I have tried and I hope with at least partial success.

The Council has been somewhat concerned by the decline in membership which the Society has experienced. Attention has therefore been given to plans for wider publicity for the 1993-1994 session which we hope will bring in more members.

Finally, the Council has been made aware of the severe pressure which cuts in local government spending are imposing on the budget of the County Council Museums Service. Our Society played a significant role in the original establishment of the Museum in Leicester and in consequence has always enjoyed the free use of these premises for its meetings. The cost of holding our meetings is not inconsiderable and therefore Council has been mindful to consider any reasonable steps which would limit this expenditure.

Maurice H. Bailey, President 1992-3.

PROGRAMME FOR THE 1991-2 SESSION

5th October 1992  THE HEYDAY OF ELECTIONS AND ELECTIONEERING President’s Address by M.H. Bailey.

19th October  SCIENCE IN THE SUPERMARKET by Sir Geoffrey Allen of Kobe Steel Ltd. (Royal Society of Chemistry Lecture).

2nd November  THE LIFE AND TIMES OF ERIC FRASER by the Rev. Geoffrey Fraser (the artist’s son) sponsored by British Gas to commemorate the work of William Murdock 200 years ago.

16th November  OLIVER ST JOHN - CROMWELL’S CHIEF JUSTICE by His Honour Judge Christopher Young, Senior Crown Court Judge.

7th December  REFLECTIONS ON LEICESTERSHIRE’S ARCHAEOLOGY by Dr Alan McWhirr, School of Archaeological Studies, University of Leicester.

4th January 1993  THE STUFF OF DREAMS - A VIEW OF SHAKESPEARE’S PLAYS by Mrs Mary Mestecky, Tutor in Drama, Vaughan College, sponsored by Leicester University Bookshop.

18th January  THE HEART OF THE MATTER by David De Bono, British Heart Foundation Professor of Cardiology, Leicester University.

1st February  THE LONDONDERRY PLANTATION 1609-1914 by James Stevens Curl, Professor of Architectural History, De Montfort University, Leicester.

15th February  THE MEDIA TODAY by Nicholas Herbert (Baron Hemingford), Secretary of the Association of British Editors. Sponsored by the Leicester Mercury.

1st March  COMMERCIAL EXPLOITATION OF OUR FOSSIL RESERVES by Stan Wood, fossil hunter. Joint lecture with the Geology Section.

15th March  COSTS AND BENEFITS OF BAT CONSERVATION by Dr D.B. Stebbins, writer and broadcaster. Joint lecture with the Natural History Section.

26th April  Annual General Meeting, followed by a Recital given by Unipart.
REPORT OF THE GEOLOGY SECTION 1992-3

Officers and Committee
President: Dr R.J. King
Chairman: Colin Green
Vice Chairman: Dr R.G. Clements
Secretary: Mrs E. Bellamy
Assistant Secretary: Mrs Margaret East
Treasurer: D. Lazenbury
Field Secretary: Alan Dawn
Committee:
John Colby
John Martin,
Dr Trevor Ford
Graham Stocks,
Kingsley Lloyd

Summer Excursions:
April 5th 1992  Mount Sorrel granite quarry
May 9th.  Oxford Clay at Whittlesey, Peterborough
June 24th  Stamford Stone Buildings Trail
July 5th.  Ashover anticline, Derbyshire
July 22nd  Ketton quarry, Middle Jurassic limestones
August 15th  Triassic gypsum etc. at Newark
September 5th  Carboniferous of Castleton, Derbys.

Winter Programme
October 7th 1992  THE FORMATION OF PILLOW LAVAS by Dr Alan Mills, University of Leicester.
October 21st  GRAPTOLOITE ECOLOGY by Dr Sue Rigby, University of Leicester.
November 4th.  THE RELATIONSHIP BETWEEN GEOLOGY AND ASTRONOMY by John Armitage.
November 18th  CLASSIC COASTAL LANDFORMS OF SOUTHWEST ENGLAND by Peter Keene, Oxford Brookes University.
December 2nd.  MONITORING ACTIVE VOLCANOES by Prof. Geoff Brown, Open University.
December 16th.  Xmas party.
January 13th 1993  ENVIRONMENT AND EVOLUTION IN JURASSIC GYRPHAECAS by Andy Johnson, University of Derby.
January 27th.  VOLCANIC STUDIES IN MADAGASCAR by Dr A. Saunders, University of Leicester.
February 10th.  READING THE HARD ROCKS OF LEICESTERSHIRE by Dr M.J. Le Bas, University of Leicester.
February 24th.  Members Evening.
March 1st.  COMMERCIAL EXPLOITATION OF OUR FOSSIL RESERVES by Stan Wood, palaeontologist, Edinburgh.
March 6th.  THE MINERALOGY OF LEICESTERSHIRE. Saturday School at Vaughan College, with talks from T.D.Ford, Gill Weightman and R.J.King.
March 10th.  AN EVENING WITH ALAN - ON JURASSIC REPTILES by Alan Dawn of Stamford.
March 24th.  A.G.M. and Chairman's Address THE GEOLOGY OF WATER

REPORT OF THE NATURAL HISTORY SECTION 1992-3

Officers and Committee
President: Miss J.E. Dawson
Chairman: Mrs M.E. Barron (retired April 1992)
E.J.W. Venable (elected April 1992)
Vice Chairman: E.J.W.Venable (to April 1992)
M.E. Broughton (elected April 1992)
Hon. Secretary: Mrs E.C. Loosmore,
Hon. Assistant Secretary: Mrs D. Thompson,
Hon. Programme Secretary: Miss J.E. Dawson
Hon. Treasurer: Miss R.M. Ewen,
Hon. Editor: Mrs D. Thompson
Committee:
Mrs G. Ball (elected April 1992)
M.E. Broughton (to April 1992)
Mrs J. Cooper (retired April 1992)
D.V. Course
J. Daws (elected April 1992)
A. Fletcher
Mrs A. Gregory
Mrs L. Hackney
Mrs P. Heighway
K.D. Smithson

Winter Programme 1992
January 8th.  AT HOME WITH WHALES AND DOLPHINS by Dr Tony Martin
January 22nd  ROUND ISLAND by Dr David Bullock
February 5th  WORLD OF WOODLICE by Dr Stephen Hopkin
February 17th  BRITISH WILDLIFE: THE EUROPEAN PERSPECTIVE by Dr Derek Ratcliffe (Joint Meeting with Parent Body)
February 19th  ROYAL BOTANIC GARDENS, KEW by Mrs Gail Bromley
March 4th  ROTIFERA by Eric Hollowday
March 18th  NATURAL HISTORY OF LEICESTERSHIRE WOODLANDS by Michael Jeeves
April 1st  A.G.M. Quiz and Social Evening
October 14th  Members’ Exhibition Evening
October 28th  BRITISH SHREWS by Dr Sara Churchfield
November 11th  WHY BUGS MATTER by Dr Roger Key
November 25th  LEICESTERSHIRE'S HEDGEROWS by Christine Kirk (20th Sower Memorial Lecture)
December 9th  WILD BEES, CONSERVATION AND PEOPLE by Chris O'Toole

Summer Excursions 1992
April 25th  Mount St Bernards Abbey and Blackbrook Reservoir led by Doreen Thompson

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<th>Date</th>
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<td>Bat count at Charnwood Lodge led by Maggie Frankum</td>
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<td>July 4th</td>
<td>Ketton Grange led by Jan Dawson</td>
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<td>July 17-19th</td>
<td>Gower Peninsula led by Janet Rowe and Phil Lucas</td>
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<td>Moths at Wanlip Gravel pits led by Harry Ball</td>
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<td>August 9th</td>
<td>Cadeham and Grace Dieu led by Phil and Gill Carpenter</td>
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<td>August 19th</td>
<td>Lichens at Narborough Church led by Tony Fletcher</td>
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<td>Swithland Reservoir led by Colin Green</td>
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<td>September 12th</td>
<td>Watermead Ecological Park led by Rory Sanderson and John Matthais</td>
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<td>Fungus Foray, Botany Bay Covert led by R. Iliffe</td>
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<td>October</td>
<td>10th Thistleton Gullet geology led by Roy Clements</td>
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### Membership List 1992-1993

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<td>Dickinson, Mr J.H., B.Sc., Eng., FIMinE, FGs., FCollP., 118 Meadow Lane, Coalville LE6 3DP</td>
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<td>Fisher, Mr B.A., 29/4 Storlot Jabotinsky, Netanya 42.277, Israel</td>
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<td>Ford, Dr T.D., 21 Elizabeth Drive, Oadby LE2 4RD</td>
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<td>Gibson, Mr H.L., 15 Links Road, Kidwroth Beauchamp LE8 0CD</td>
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<td>Hamilton, Mrs B.P., 78 Anstey Lane, LE4 9FB</td>
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<td>Hill, Mrs J., 4-2 Barons Way, Mountrurle LE12 7EA</td>
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<td>Holloway, Prof J.H., B.Sc., Ph.D., D.Sc., C.Chem., FRSc., 43 Morland Avenue LE2 2PF</td>
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<td>Holme, Mr H.J.E., 9 Shanklin Drive LE2 3QE</td>
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<td>Holmes, Mr D., The Old Bakehouse, 18 Main Street, Kidwroth Harcourt</td>
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<td>Howard, Mr. R.A., B.Sc., C.Eng., FIM, Townhead Farm, Leicester Road, Markfield LE5 6H</td>
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<td>Humphreys, Mr E.H., Nook Farm Cottage, 39 Church Lane, Ratby LE6 0IF</td>
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<td>Jackson, Mr J.C., 7 Howard Road, Glen Parva LE2 9JH</td>
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<td>James, Mr J.N., 6 Elsalene Court, London Road LE2 2PN</td>
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