Abstracts of Periodical Literature

SIMON PEPPER and PETER RICHMOND

ROBERT G. ANGEVINE, **Individuals, Organizations, and Engineering: U.S. Army Officers and the American Railroads, 1827-1838**, *Technology and Culture*, Vol. 42, No. 2, April 2001, pp. 292-320. In the early days of American railroad construction, the strategic value of communications was often stressed as a means of securing the services of U.S. Army engineer officers in the skilled work of track surveying and planning. Later communication systems – notably the interstate highways – made similar claims, of course, but the rapid growth of early railroads made special demands on the engineering profession. West Point, then as now, produced engineers, the best of whom entered the Corps of Engineers where they formed the largest pool of professional expertise in the country. One question posed by this paper is whether the military tendency toward order and uniformity limits the independence of creative spirits? Again, does military patronage define, for better or worse, the character of a technology? Ken Alder's recent work on French artillery officers' vision of the organisation of the nation's technological life prompts this last question, which clearly goes well beyond the acknowledged role of the US military in exploration, road and bridge building, water management and arsenal-based industrial mass-production in the nineteenth century. Angevine's examination of the engineer officers' contribution to US railroad development leads him to conclude that here the relationship was more modestly political. Officers valued the pay supplements and better living conditions in the more developed areas of the country which saw the early railroads: companies needed trained engineers and often gained advantages from the family connections of officers who were commercially neutral, but who often anticipated well paid jobs in the private sector when they left the service. Uniformity scarcely came into it. Both the Union and the Confederacy experienced enormous frustration during the Civil War from the lack of standardisation in both railway track and rolling stock!

C. EDSON ARMI, **The Nave of Saint-Philibert at Tournus**, *Journal of the Society of Architectural Historians*, Vol. 60, No. 1, March 2001, pp. 46-67. Well-known for its unusual pattern of crossways-oriented barrel vaults carried on diaphragm arches, the nave of Saint-Philibert at Tournus in the Rhone valley is the subject of a new study which challenges most accepted assumptions about the design, execution and chronology of its construction. This last is seen as both different and more complicated than previously supposed. In the church points of interruption occur at quite unexpected – though often structurally logical – locations. These changes reveal new information about the masons who built the church, and who can be identified as working within two traditions: those using [northern] brickwork construction and those using [southern] stone. The masons integrated architecture and sculpture; merged different traditions of building; and coordinated the processes of design, construction, and structure. Within campaigns they refined the design of the building, and between campaigns they radically altered the masonry, mouldings and capital decoration. Contradicting the idea that churches were first conceived and then built, at times during the construction of Tournus masons combined the separate stages of planning and execution.

WILLIAM C. BAER, **Housing the Poor and Mechanick Class in Seventeenth-Century London**, *The London Journal*, Vol. 25, No. 2 (2000), pp. 13-39. Housing increased markedly in seventeenth-century London despite numerous royal building proclamations and parliamentary statutes against its proliferation (which were often used, in practice, to control the quality as well as the quantity of buildings which were given exemptions). This paper interestingly attempts to employ a modern

"housing needs" approach to understand the housing circumstances of the poor and mechanick (today we would say, artisan) classes in the face of these policies of restraint. A "consistency framework" is employed to order a composite of various household behaviours and housing opportunities. By partitioning these classes into their respective housing circumstances, the types and relative magnitudes of housing deprivation experienced can be classified. Depending on their degree of poverty, the poor sought free shelter, or charitably-provided shelter, or crowded into rooms, chambers, tenements, and divided housing. The author concludes that the upper end of the mechanick class might even have been able to afford new construction. This aspect is explored first by charting the distribution and the quality of housing enjoyed by most Londoners based on their occupation and the number of hearths in their housing band. Tentative estimates are then made of the cost to build new housing and what it might lease for annually. Finally, these costs and the associated number of hearths are plotted against the initial distribution of employment and hearths to conclude that some of the mechanick class could have afforded new construction which had been built to "proclamation requirement" and especially to the standards established in the Rebuilding Act following London's Great Fire. Such an analysis also permits an assessment of the effects on housing provision of the various building proclamations.

JOHN BROAD, **Housing the Rural Poor in Southern England, 1650-1850**, *The Agricultural History Review*, Vol. 48, Part II (2000), pp. 151-170. This fascinating paper explores a variety of policies and experiments which provided alternatives to the well-known and much published eventual recourse to the Parish Workhouse. Squatting, the use of self-build temporary timber huts on waste land, church houses (including former pre-dissolution chantry buildings) and the subdivision of existing houses or village plots all have a part to play in John Broad's survey. The core of his essay concerns early efforts to meet the needs of the rural poor through the construction or purchase of parish or privately-sponsored cottage housing, but it also explores mechanisms whereby impoverished cottage-owning families could be supported for life in exchange for all the family's goods and real property, and the adoption as public tenants of paupers resident in the property of absentee owners. This kind of broad-brush "joined up" history reminds us that a fully-rounded construction history needs to consider the full life-cycle use of buildings.

WIEBE E. BIJKER and KARIN BIJSTERVELD, **Women Walking through Plans: Technology, Democracy, and Gender Indentity**, *Technology and Culture*, Vol. 41, No. 3, July 2000, pp. 485-515. Historians of technology are becoming increasingly interested in the control of technological culture, a term which embraces both the efforts of small groups of experts to direct technology, together with its educational and professional culture, and what might be called the "democratisation" of that culture by non-expert citizen groups. This last is the thrust of Bijker and Bijsterveld's paper which outlines the influence of the Netherlands' Women's Advisory Committees on Housing (VAC). The first of these organisations was established immediately after World War II, and they presently number some three hundred, active in almost half of the municipalities in the Netherlands. The women who serve on these committees are not paid, they are self-appointed, and they are not officially accountable to anyone. Few members have any professional training as architects or town planners. The authors sketch the pre-history of the VACs in the early twentieth century efficiency movement and the proponents of home economics, and in the strongly functionalist tenor of inter-war Dutch social housing before describing the low-key, well-informed, but non-confrontational style of their involvement in the housing process which has proved effective in influencing numerous aspects of house design, estate layout and wider planning issues. The footnotes provide an excellent bibliography of gender politics in housing and architecture, and this is obviously a concern of the authors. But it is not gender politics but "peacekeeping strategies" – the authors' phrase – which has succeeded in many communities in establishing the VAC as part of a consultative network which includes civil

servants, planners, architects and builders, and which has opened doors that would probably have been closed to more strident advocates.

CATHERINE BOWLER and PETER BRINDLECOMBE, **Environmental Pressures on Building Design and Manchester's John Rylands Library**, *Journal of Design History*, Vol. 13, No. 3 (2000), pp. 175-91. The enormous growth of the Victorian city and its parallel polution problems – not new, but bigger than in earlier centuries – confronted architects with great difficulties, particularly in connection with a library containing valuable books and users relying on natural lighting for much of the day. Environmental pressures included denial of daylight, overcrowding, ackward sites, noise, accessibility and visibility of buildings, and air pollution. Corrosive pollutants were especially damaging to the minutely detailed Gothic architecture popular in Victorian Britain. Dense smoke made cities dark, coated windows and penetrated inside damaging their contents. Basil Champneys, in designing Manchester's John Rylands Library, responded to these problems in a way that reflected the best of nineteenth-century environmental design. Durable materials and colours able to resist atmospheric pollution were employed on the outside. Electric lighting and a fan induced air filtration and heating system (the electricity generated on site) were employed to condition an interior which was sealed at the building's entrances. The authors' treatment of this subject is informed by the detailed client and project correspondence preserved in the John Rylands Library Archive.

H. CHANSON and D. P. JAMES, **Railway Dams in Australia: Six Historic Structures**, *Transactions of the Newcomen Society*, Vol. 71 (1999-2000), pp. 283-303. Steam railway locomotives demanded supplies of water at regular intervals, and the development of Australia's railway system through sparsely settled and poorly watered regions depended heavily on the construction of dammed reservoirs (which could also serve livestock and the needs of nascent settlements). The earliest Australian reservoirs (dating mainly from the 1850s and 1860s) used earth dams, employing the British formula of earth embankments with clay puddle cores. But an early exception was the Parramatta arch dam (1851-56), which was built by Simpson and Moriarty, respectively a former Royal Navy officer and naval engineer, both familiar with ship hull shells and the thin cylinder formula (and possibly with the pioneering Meer Allum multiple arch dam in India (c. 1804) and the Jones Falls dam in Canada (1831), which had been designed by Royal Engineers). Parramatta's masonry arch was to be followed in Australia by innovatory designs for the concrete arch 75-Miles dam (1879-80 and probably the oldest of its kind in the world), the brick-built curved slab wall Tallong Railway dam (1897), and the oldest reinforced-concrete thin-arch De Burgh dam (1896). The authors have researched the backgrounds of the engineers responsible for these later designs and conclude that the broad-based skills of men used to applying themselves to civil, hydraulic, electrical and mechanical tasks in military and colonial railway engineering were well suited to innovation.

DONALD G. CLOW, **William Haywood and Municipal Engineering in the Victorian City of London**, *Transactions of the Newcomen Society*, Vol.72 (2000-2001), pp. 39-76. The career of William Haywood (1821-94) has been overshadowed by that of Sir Joseph Bazalgette who, nevertheless, is reported as saying of him that "for matters of drainage, street alignment and paving, he [Haywood] stood foremost in the kingdom." Haywood's formal education had been ended by the death of his father. Trained as an architect in the office of George Aitchison (architect and resident surveyor to the St Katherine Dock Company), in 1845 Haywood left architecture ("the great mistake of his career") for the relative security offered by the post of Assistant Surveyor to the Commissioners of Sewers for the City of London. In 1846 he was appointed Surveyor (later re-styled Engineer and Surveyor) becoming MICE in 1853 and FRIBA in 1857. Much of his work centred on the modernisation of the City's sewers, steering a middle course in the unedifying debate later known as the "Pipe-&-Brick

Sewers War" between Chadwick's advocacy of small cross-section earthenware pipes and those who argued for brick-built man-entry sewers. Haywood used both, and pioneered the use of permanent brick-lined manholes at regular intervals for cleaning. Later, as employee of a City Council notorious for its indifference to sanitation, he collaborated with Joseph Bazalgette (for the Metropolitan Commission) on the great scheme for diverting sewage from the Thames which now carries Bazalgette's name. Street paving and cleaning, cemeteries, the construction of pedestrian islands in the middle of busy streets, the controversial Holborn Viaduct project (when he was accused of plagiarising an unsuccessful competitor's design) and support for "sub-surface railways" against elevated rights of way marked a long and distinguished career which saw him honoured by four European states, a Colonel of militia, and an estate valued at £42,606 (over £2 million in present-day value). The knighthood he somewhat surprisingly did not receive, suggests the author, was more likely to have been the result of his unorthodox life-style (with a living-in lover and an undivorced wife) than the backlash from the Holborn Viaduct scandal.

AMANDA COOKE and AVI FRIEDMAN, **Ahead of Their Time: The Sears Catalogue Prefabricated Houses**, *Journal of Design History*, Vol. 14, No. 1 (2001), pp. 53-70. Several American companies offered high-quality, pre-cut and prefabricated houses in the early twentieth century, the most successful in the years before World War II being the Chicago-based firm of Sears, Roebuck and Company. Sears sold houses through their mail order catalogue as well as through direct sales offices to nearly 100,000 customers between 1908 and 1940. The catalogues illustrate a wide range of housetypes and traditional styles, most of which cannot easily be distinguished from more conventionally built timber balloon-frame houses in the suburbs and small towns of middle America. Generally they were sold pre-cut, rather than fully panelised, but all holes were bored and millwork provided, an important labour saving feature in days before power tools were used on most sites. The carpenter was expected to trim the diagonally set sub-flooring on site, and trim and mitre external sheathing. Building paper, paint and varnishes, lumber, lath, shingles, roofing and windows were all provided in packing cases which would be shipped from one of the company's factories in a maximum of two boxcars to the local railhead. The customer provided the transport from that point, plus foundations, and site services (and masonry cladding, in the event that this was chosen). Despite an advanced product, effective marketing and impressive sales figures, Sears's Home Construction Division eventually failed when the generous company self-financed mortgage scheme encountered too many personal defaults in the depression.

KEITH FALCONER, **Swindon – Brunel's Ugly Duckling**, *Industrial Archaeology Review*, Vol. XXII, No. 1 (2000), pp. 3-20. This is the published version of the author's Rolt Memorial Lecture of 1998, and (very appropriately, given Tom Rolt's record as biographer of Isambard Kingdom Brunel and Falkner's joint authorship of *Swindon: The Legacy of a Railway Town*, HMSO, 1995) it addresses the curiously under-published story of Brunel's involvement in the design of Swindon's early GWR buildings during the 1840s. Often attributed rather casually to Sir Daniel Gooch (Chairman of the GWR, who does indeed seem to have selected their site), Falkener's research on the drawings and sketchbooks held by Bristol University, the Wiltshire Record Office and railway archives establishes that Brunel's office produced the designs for the original locomotive repair and maintenance sheds, the later works in which the company's engines and rolling stock were built, the Swindon railway station (with its extensive refreshment rooms for the mid-journey meal stops), and the settlement where the company's employees were to be housed. The illustrated drawings themselves contain much that will be of interest to construction historians including details of the supports for the tracking rails carrying the overhead cranes inside the workshops, a variety of early trussed roofing arrangements that were needed for the large industrial spans, and the five foot deep tensioned trussed wooden floor beams used to achieve 45 ft spans in 'D' shop, where the beam engines of the main power plant were

carried on two floors. Unlike many of the other structures, these floor trusses survive within the present altered building, and are quite unlike any trusses identified elsewhere. Early sketch designs for the cottages illustrate quasi-Elizabethan detailing (shades of the *cottage-ornée*) on terraced dwellings laid out each side of a central open promenade. Here, as in the station restaurant complex, the first contract resembled an early version of PFI, with contractors undertaking to deliver approved schemes for rental by the company. These arrangements broke down before long, and the GWR schemes reverted to the more common "company town" patterns.

MARK GARDINER, **Vernacular Buildings and the Development of the Later Medieval Domestic Plan in England**, *Medieval Archaeology*, Vol. XLIV, 2000, pp. 159-179. The great majority of later medieval houses were constructed according to a standard plan, insofar as finance and other consideration allowed. The buildings of the gentry were larger and the plan more complex than those of their peasants, but the key features of services room, cross-entry way, hall and (sometimes) chamber were to be found at many social levels. This plan was transformed in the sixteenth century, and it is this transformation that has attracted much more scholarly interest than the origins and subsequent development of the standard medieval plan which is the subject of Mark Gardiner's paper. He rejects suggestions of its origins in the (agricultural) longhouse, or in structural developments (such as post-truss or cruck construction). This case is based mainly on excavation evidence, rather than standing buildings which have nearly always been modified many times. The standard medieval plan is identified in twelfth century buildings which used posts set directly in the soil (the depth of the post hole indicating the structural importance of the member) and had further structural posts at the mid-point of the gable end, indicating support for a ridge beam (which was not of course needed in cruck or truss construction). The argument defies too much abbreviation, but is important for readers interested in medieval timber domestic construction.

M. H. GOULD and B. M. J. BARTON, **Early Reinforced Concrete Water Towers, 1900-1930**, *Transactions of the Newcomen Society*, Vol. 71 (1999-2000), pp. 269-281. Water towers were a characteristic feature of the industrial landscape and Victorian country houses, and represented a special engineering challenge because of the need to support and brace a very heavy weight often high above the ground. The combined clock and water tower at Farmleigh House, Co. Dublin (c.1800) was a pioneer in this area, but the much larger Lochside Cistern at Montrose (c.1841), Robert Stephenson's tower at Blisworth, for the London and Birmingham Railway (c.1846), and the structure on top of Tower Hill at Ormskirk (1850) set a pattern for brick or stone structures with metal tanks. The advent of reinforced concrete in the early twentieth century, however, saw a new wave of major structures from the specialist construction companies serving the public utilities. This paper outlines the contributions of Mouchel and Partners (UK licensee for Hennebique), the Indented Bar Company (taking their name from the patented reinforcing bars), Coignet, Kahn (Truscon) and a number of other less prolific companies. By comparing jobs and tender figures the authors indicate the extreme competitiveness of the field in which concrete, steel (and in the USA and parts of Europe, timber structures) were unusually evenly matched.

BESIM S. HAKIM, **Julian of Ascalon's Treatise of Construction and Design Rules from Sixth-Century Palestine**, *Journal of the Society of Architectural Historians*, Vol.60, No. 1, March 2001, pp. 4-25. Julian of Ascalon was an architect and a native of the Byzantine Palestinian coastal city of Ascalon in the time of the emperor Justinian I (AD 483-565, reigned 527-65). Probably the treatise was written during the years 531-33, when the codification of Roman law that resulted in the influential *Corpus Juris Civilis* was undertaken on Justinian's order. Julian's treatise is a compilation of construction and design rules that address the prevention of nuisances and potential damage to

neighbours resulting from building activities in congested Middle Eastern towns where domestic building crowded its neighbours and often reached three storeys in height. Although public rights are protected, most of the treatise concerns relationships between adjacent private properties with some interesting early formulations on the rights to light and views, party wall relationships and construction standards which – if applied – would reduce the need for rules requiring set backs from property boundaries. Its influence endured intermittently for almost 1,400 years, first in Constantinople, then in the eastern territories of the Byzantine empire, and later in some Slavic countries: in Greece it survived well into the twentieth century. This is the first study to analyse the technical aspects of Julian's prescriptions.

ELENI HASAKI, **Rectangular Ceramic Kilns in Greece: Issues of Technology and Production**, *American Journal of Archaeology*, Vol. 105, No. 2 (2001), p. 298. Most ceramic firing kilns from ancient Greece are circular or pear shaped, but a distinct group of larger rectangular shaped kilns is analysed in this conference poster to identify large-scale, specialized workshops from the more limited production centres. Accounting for some 20% of excavated examples for the period 1000-300 BC, the earliest rectangular kilns date to Geometric times (those at Samos and Kyme), but are most numerous in the Classical period. With an average size of 3m x 3m, they are considerably larger than their circular counterparts. Rectangular kilns were used primarily for rooftiles, but the firing of other bulky objects such as burial sarcophagi or bathing tubs cannot be excluded. The economics of firing such a kiln (which took four tons of wood, just for fuel) would deter any minor artisanal establishments from investing in a rectangular version. One can estimate the capacity of a rectangular kiln and draw rough time schedules for producing roofs of different sizes (for treasuries, temples or stoas). Kiln capacity also provides a tool to calculate volume of ceramic production, complementing estimates based on trade or potters' yearly output. Rectangular kilns can be identified attached to specific building programmes (Nemea and Olympia sanctuaries), or at large-scale tile production centres (Corinth), as well as in combination with circular kilns (Athens, Pherae, Sindos) in much larger factory sites containing separate specialist production areas.

NICK HAYES, **Civic Perceptions: Housing and Local Decision-Making in English Cities in the 1920s**, *Urban History*, Vol. 27, no. 2 (2000), pp. 211-233. Readers scanning titles would never guess that this paper is about the differing approaches to the use of non-traditional housing construction systems adopted by Leicester and Nottingham. The 1920's booms in industrial housing are normally explained by the availability of new materials such as steel at the end of World War I, by shortages of traditional skills caused by wartime casualties and lack of apprenticeships, and central government encouragement for experiments that promised greater productivity (not to mention the pro-industrial rhetoric of the Modern Movement). Here the author looks closely at the local politics of housing in two East Midlands cities, both of which had avoided non-traditional systems in the initial wave of construction immediately following the Great War, but were pushed into the adoption of concrete systems (Leicester) and steel-and-concrete (Nottingham) by campaigns orchestrated by the local press in the mid-1920s. Nottingham's Crane system (developed collaboratively by the city architect, T. C. Howitt, and the chair of the housing committee, William Crane) contributed only 3% of the city's inter-war social housing but was accepted as a local product after favourable press coverage. Leicester's heavy reliance on Henry Boot's concrete system provided 16% of the city's inter-war social housing stock (four times the national average) and left a legacy of problems which were to be criticised by the same local media which had enthusiastically endorsed the adoption of system-building as an earnest of the council's efforts to satisfy housing needs.

CAROLYN HEIGHWAY, **A Medieval Water Tank in Cloister Garth of Gloucester Cathedral**, *Transactions of the Bristol and Gloucestershire Archaeological Society*, Vol. 118, 2000, pp. 190-201.

A medieval water tank uncovered in the cloister garth of Gloucester Cathedral in the late 1880s has recently been reburied. This note describes the tank in detail and presents evidence for its date and original purpose. It was constructed for the monks of Gloucester Abbey in either the 12th or the 13th century and was probably intended to form part of a flushing system for drains in the abbey precinct.

JAMES S. HERBST, **Cement Mortar and the Roof of the Archaic Temple at Nemea**, *American Journal of Archaeology*, Vol. 15, No. 3 (2001), p. 521. This abstract from a conference poster session reports excavations in 1978-80 at Nemea which uncovered the debris from the destruction by fire in the late fifth century BC of the Archaic temple of Zeus. The broken blocks and terra-cotta tiles from the carbon-laden wreckage sketched a picture of a temple with a hipped roof on at least one end. Decoratively and typologically the tiles resemble the Argive roofing system, reflecting an early sixth century BC construction date and Nemea's proximity to the Argolid. Recently in the 1998-99 seasons an early geison block (a block shaped to receive timber roof members) and identical tiles emerged in landscaping fill near the later bath, apparently brought from the early temple's debris. The geison and many of the pan tiles, cover tiles, and antefixes preserve cement mortar on their surfaces. While the use of mortar on early roofs is not unprecedented, the state of preservation of the tiles and geison, and the judicious placement of cement, permits us to hypothesize its purpose – the Nemean temple builders used cement for securing the lighter tiles and for fastening the eaves tiles to the geison. Interestingly, the Argive roofing system made little use of nails as fasteners even though the lighter elements, the cover tiles, antefixes and ridge tiles would have been susceptible to being dislodged by the wind. The study presents a reconstruction of the rafter and roofing system of the early temple at Nemea in light of the geison, the mortar, and the tiles.

MARK WILSON JONES, **Doric Measure and Architectural Design 2: A Modular Reading of the Classical Temple**, *American Journal of Archaeology*, Vol. 105 (2001), pp. 675-713. Despite its enormous influence, the methods used to design the ancient Doric temple remain a largely unresolved question despite the considerable scholarly effort dedicated to its investigation. This lack of resolution reflects to some extent lapses of regularity and symmetry in Doric temple plans, lapses that Vitruvius called "the faults and incongruities" that flowed from the notorious problem associated with the configuration of the peristyle and its frieze at the corner. This problem was compounded in the archaic period by the prevailing reliance on rules of thumb, and a later approach toward making individual decisions. By the second quarter of the fifth century (BC), architects had acquired a greater control over the design process, becoming able to instill their projects with improved coherence and precision, as well as neater proportions. The most striking manifestation of this shift is the widespread adoption of a 2:3 ratio between the widths of triglyphs and metopes, a relationship that automatically generated column spacings equivalent to 5 triglyph widths. This analysis of the facades of ten relatively well preserved hexastyle temples shows that the triglyph width was much more than just one consideration out of many; it constituted the very lynchpin of a fully-fledged modular design method. It also, significantly, tallies with the evidence of Vitruvius, our sole ancient authority. In the past, scholars have tended either to trace Vitruvius's account only as far back as the Hellenistic period, or alternatively to doubt its legitimacy altogether. It now emerges that Vitruvius perpetuated principles and practices that went well back into the fifth century.

WENDY NORBURY, **Oxford Town Hall: Planning, Building and Financing the Oxford Municipal Buildings of 1897**, *Oxoniensia*, Vol. LXV, 2000, pp. 133-160. Designed by Henry Hare, a young London architct who was to become one of the most successful of his generation in the field of public buildings, the Oxford Municipal Buildings were opened with grand ceremony on 12 May 1897, some 25 years after the city had first considered the question of new facilities. In that time estimates for design and construction had risen from a few thousand pounds to £50,000 at competition

stage, and then were fully revealed at completion as well over £90,000. This paper investigates that progression, explains why it took so long for Oxford to receive its new civic buildings, looks at the various decision-making stages, discovers how such an expensive work was funded, and discusses the main supporters and opponents of the project. The driving force behind the project is identified as Alderman Robert Buckell, aided throughout by Alderman Walter Gray. The early account takes place against a background of major political change in Oxford local government as county borough status was attained and Oxford corporation gained its independence from the university. Allowed once more to assume the reins of power that it had lost so many centuries before, the outward, and almost instantaneous, manifestation of this power was embodied in the new Municipal Buildings – Oxford Town Hall.

PETER SCOTT, **Industrial Estates and British Industrial Development, 1897-1939**, *Business History*, Vol. 43, No. 2, April 2001, pp. 73-98. The Garden City movement is rightly credited with strong influence on the subsequent patterns of both private and public sector housing in early twentieth-century Britain; but this paper highlights another bi-product of Letchworth and Welwyn, the industrial estate. Concentrated overwhelmingly in London and the South-East (with the only large-scale northern examples at Trafford Park and Bromborough Port), the industrial estates combined healthy working conditions in "garden" landscapes, improved transport connections and offered standardised factory buildings which could be let on favourable initial terms, either with space for expansion or with larger premises close by to accommodate growth.

STEPHEN J. SHERLOCK, **Nineteenth Century Workers' Houses in Redcar, Cleveland**, *Durham Archaeological Journal*, Vols. 14-15, 1999, pp. 177-86. Conventionally we think of cholera striking in the then older property areas of early Victorian towns, but very often the disease emerged in newly built housing where "modern" water supply pipes were laid too close to leaking drains or cess pits. This seems to have occurred in the rapidly growing fishing and seaside community of Redcar during the 1840s, when the Earl of Zetland's new architect-designed housing development known as Fisherman's Square was pulled down only four years after its construction following the death of eight people out of the 97 residents. The author has reconstructed the early scheme, which was designed by the Newcastle architects John and Benjamin Green, but not apparently built to the architects' plans which show through-terrace cottages each with a back yard containing a coal store, privy and ash pit. A contemporary survey, however, shows communal toilets and wash houses in the centre of the square around which the cottages were built. The shared facilities were blamed for the cholera outbreak in the Earl's new cottages where investigators found "a cess pool full of sad filth, which stank awfully ... and all the water pipes pass through the centre of the cess pool." Redcar's early reputation as a healthy seaside resort was further damaged in the 1860s by an outbreak of typhus in recently constructed back-to-back cottages.

CATHERINE SMITH, **Urban Improvement in the Nottinghamshire Market Town, 1770-1840**, *Midland History*, Vol. XXV, 2000, pp. 98-114. The Public Health Acts of 1848, 1858 and 1866 marked the first national initiatives for urban improvements which focussed initially on sewerage and water supply before tackling what today would be seen as the proto-planning concerns of street layout and housing byelaws. Late eighteenth and early nineteenth-century improvements concentrated on a different agenda, often more closely reflecting the aesthetic priorities of what the author identifies as "polite society" and implemented through a variety of committees, commissions, trusts, charities and local acts which meant that no two towns were quite the same. This is the period covered by Catherine Smith's paper. The study concentrates on four Nottinghamshire market towns – Newark, Mansfield, Worksop and East Retford – and examines the different mechanisms employed by these urban authorities for the finance and delivery of new public buildings, markets, bridges, street paving,

lighting, and cleaning, in addition to the water supply and sewerage which was to become such a central civic concern in the age of the cholera outbreaks.

BRUCE WALKER, **The use of 'skailie' in Medieval and Post-Medieval Scotland**, *Antiquity*, vol. 75, number 287 (March 2001), pp. 163-71. The dominant roofing material in Scotland from the prehistoric period to about 1900 was thatch, a term which embraced a variety of vegetable materials including seaweeds, bracken, dock, iris reeds, rushes, natural grasses and cultivated cereals. *Thatch* (alternatively ***theik***, or ***thak***) became a generic term for roofing; hence, as late as the 18th century, descriptions of certain high-status buildings have them "thatched with ..." tile or slate. These high-status building accounts also mention *scailie*, *scailyie*, *scail?e* or *skailie* – spellings close to *scait*, *sclate* or *slate*, which has led to its interpretation variously as slate (blue or grey), stone, or tile. Although all of these materials were known and used in Roman times, there is no evidence of their large scale production in Scotland until the mid-18th century; and even after that time their use was less common than in England where the main centres of urban building were closer to the areas of production. The author believes that 'skailie' in fact refers to timber shingles and marshals an impressive range of clues (including decoration on hog-backed tombstones, the observations of mid-Victorian antiquaries, and Museum exhibits) which suggests that high-status buildings in Scotland shared in a tradition of Northern shingle roofing which extended through Scandinavia, central Europe, Romanian Transylvania and Russia.

BERNARD C. WORSSAM, **The Building Stones of Rochester Cathedral Crypt**, *Archaeologia Cantiana*, Vol. CXX, 2000, pp. 1-22. Analysis of the stone used in major projects conveys insights into the extent of the supply systems serving the ancient and medieval construction world, as well as helping archaeologists unravel the chronologies of buildings which have seen centuries of reconstruction and repair. Bernard Worssam's paper builds on the work of Tatton-Brown at Canterbury, Salisbury, the Tower of London and Rochester to present a closely-argued chronology for Rochester Cathedral's Norman crypt, and an explanation for what he calls a "heirarchy of stone quality to emphasise the relative importance of different parts of the design." Oolite was employed for the column shafts; soft Reigate stone for the carved capitals and other dressings; Caen stone for the richer effects in more exposed interior sites; polished Bethersden and Purbeck marbles for string courses and the abacus of columns. The oolitic stone may have been imported from Marquise near Boulogne (as in Canterbury), but in the writer's opinion was more likely to have been transported from Taynton, near Oxford, by way of the river Windrush and the Thames (a route used for the supply of oolite to a number of London's Norman buildings). The Bath stone, Portland and York Stone, Tisbury stone from Wiltshire and Lincolnshire limestone employed in nineteenth-century restorations can be dated precisely and chart the supply systems opened up by canals and railways.

FRANCIS WALLEY, **From Bomb Shelters to Postwar Buildings: 40 Years Work as a Civil Engineer in Government**, *The Structural Engineer*, Vol.79, No. 4, 20 February 2001, pp. 15-21. This interestingly frank auto-biographical sketch (in the Institution of Structural Engineers' Sutherland History lecture series) traces Dr Walley's career from his days as a student of Civil Engineering at Bristol University on the eve of World War II, graduating to wartime work on air raid precautions and the study of the effects of bombs for the R&E (Research and Experiment) section of the Ministry of Home Security, and at the end of the war onto the effect of nuclear explosions on structures. In the late 1940s he visited Germany where many pioneering prestressed concrete structures had been built during the war. The German tour proved to be a turning point in a career which later focused on his growing expertise in all forms of concrete (pre-stressed, reinforced and pre-cast), technical support for the inquiries into Ronan Point and the high alumina cement failures, and increasing disenchantment with the codes of practice which he had so often helped to draft. Engineers often learn from failures,

and war provides an abundance of experimental data. Seen in the right way, argues the author, this can be as good a learning experience as textbooks, technical publications and the codes which he now sees as robbing the engineer of creativity.

ROGER WOODLEY, **"A Very Mortifying Situation": Robert Mylne's Struggle to get Paid for Blackfriars Bridge**, *Architectural History*, Vol. 43, 2000, pp. 172-186. In February 1760 Robert Mylne won the competition for the new bridge to be erected at Blackfriars, London; and in November 1769 the bridge was fully opened to traffic, to general praise for its appearance, commercial success and general usefulness. Why then should it have taken over six years, until March 1776, to settle the architects bill? Later in life, Mylne developed a violent and quarrelsome personality, but the records of correspondence between the Bridge Committee and the young designer (aged only 26 when he won the competition) were amicable enough. Although there were some delays in construction, it was generally held that Mylne's services as engineer and surveyor (as well as architect for the project) had not been wanting. Indeed, his technical innovations included improved caisson construction platforms, underwater sawing equipment for levelling the tops of driven piles, re-usable sides for the caissons, improved centres for the arches which sprang from the piers instead of from expensive independently-driven piles, reversed arches in the upper parts of the piers, innovatory cutwaters, and the use of Baltic fir for piling and caissons which was found to be more durable than the customary oak. But although Mylne was paid a salary of £350 per annum for his supervision and administration of the project while it ran its course, the failure of the city council to pay the balance of his 5% fee for so long after completion may well have driven him into the relative security of salaried posts with St Paul's Cathedral, the New River Company and Greenwich Hospital. The £4,209 of unpaid fees could have sent his career in different directions. This is one of those fascinating articles which (for lack of the right kind of record) is never able to answer its initial question but which turns up all manner of interesting detail about the technicalities, costs, and administration of major eighteenth-century construction projects.

G. WOODWARD, **Trubshaw, Hartley and Harrison. Early Nineteenth Century Engineers and Architects**, *Transactions of the Newcomen Society*, Vol. 72 (2000-2001), pp. 77-90. James Trubshaw (1777-1853) became a highly respected Staffordshire civil engineer, building contractor and architect in a period before those professions had developed a distinct identity. He acted as engineer to the Trent and Mersey Canal Company and built the Grosvenor Bridge at Chester, still the longest masonry arch in Britain. Railway survey work and contracting occupied him at times, and he is credited with the design and remodelling of numerous churches and country houses. With Charles Barry as architect he built the Royal Manchester Institution (now the City Art Gallery). His posthumous fame undoubtedly never recovered from his daughters' burning of the greater part of his records after his death, although his diaries for the years 1820-53 survived to be copied and published privately by another relative in 1921. The author has pieced together this account of his career from the diary and from parts of his correspondence with Jesse Hartley (of Liverpool Docks fame) and Thomas Harrison (with whom he collaborated on the Dee Bridge, until Brunel's intervention and subsequent withdrawal from the project had caused Harrison himself to pull out, leaving Trubshaw to finish the job he had actually started). Hartley's testimony comes out strongly in favour of Trubshaw as author of the Dee Bridge. Hartley himself left a will causing his heirs to destroy his personal correspondence, but our author has pieced together surviving fragments from all three collaborators and business partners to cast light on attributions which often go too easily to the big name contemporaries, such as Isambard Kingdom Brunel and George Rennie. What emerges, of course, is something of the complexity of the early engineering achievements which often involved networks of business and political interests as well as "design" as it is understood today.

JIM YELLING, **The Incidence of Slum Clearance in England and Wales, 1955-85**, *Urban History*, Vol. 27, No. 2 (2000), pp. 234-54. Slum clearance has an obvious bearing on the construction activity that yields replacement dwellings or the improvement works which rescue low quality dwellings from the wrecker's ball. Yet the mechanisms which drove the great change from the clearance policies of the late-1950s and 1960s, to the improvement policies which replaced them in the 1970s and 1980s have received less attention than the sometimes ideological conflicts between the clearers and improvers. This paper attempts to establish a somewhat wider and more solidly-based policy history by analysing the differential impact of slum clearance on regions, conurbations and major cities through the three decades of the slum clearance campaign which began in 1955. It discusses the main methods of clearance, the nature of compensation and the relation of clearance to 'unfit' housing. House condition surveys revealed an increasing mismatch between patterns of unfit housing and those of slum clearance and this began, it is argued, in the 1960s. Factors such as the development of property markets, and the rise of owner-occupation, had differential economic and political effects which in turn reacted on the [dramatic recent reductions in the] incidence of clearance.

Simon Pepper and Peter Richmond
University of Liverpool