between the characteristic type of the 'Neues Bauen' and the artificial constructions of the Enlightenment.

[31] M. Foucault, *Les mots et les choses* (Paris, 1966), especially chapters 2–4.

[32] Wagner's detailed reference to the "Typenbaupläne der kurmärkischen Kriegs- und Domänenkammer" (Typified Building Projects of the Royal Prussian department for War- and Building-Affairs) is to be found in 'Neue Bauwirtschaft', pp. 15–16. F. Mielke, *Das Bürgerhaus in Potsdam* (Tübingen, 1972).

[33] The whole sentence reads, "Just as myths perform Enlightenment, so Enlightenment is, with every step, entangled deeper in mythology": M. Horkheimer and T. W. Adorno, *Dialektik der Aufklärung* (Frankfurt, 1977), p. 14.

[34] M. Foucault, *Surveiller et punir. La naissance de la prison* (Paris, 1975), chapter III s. 3.

[35] 'Modulo misura e modulo oggetto' (1958), in C. Argan, *Progetto e destino* (Milan, 1965), pp. 104–115.

[36] 'Il disegno industriale' (1955), in ibid., p. 139.

[37] Ibid., pp. 134, 135.

[38] See D. Hoffmann-Axthelm, *Sinnesarbeit* (Frankfurt, 1984), especially pp. 18 and 30.

[39] 'Progetto et destino' (1965), in Argan, *Progetto*, p. 63.

Innovation and Contracts in the Postwar British Building Industry

E. W. COONEY

During the past quarter of a century or so, and particularly during the last ten years, there has been a remarkable diversification of contractual arrangements in the building industry. This article attempts to summarise those changes in order to suggest causes and effects from a standpoint provided by the history of the building industry in Britain since the nineteenth century.* I shall emphasise the implications for the architectural profession because the architect has seen himself, and has usually been acknowledged, as 'the head of the building team', so that if innovations derogate from that status there may be exceptionally wide-ranging consequences not only for architects but also for the qualities of buildings—whether for better or worse.

A contract may appear to be a rather two-dimensional source of information, lacking in the depth of knowledge about the processes of building which is available to those who work in the industry, or are closely concerned with it as clients and customers. But the main forms of contract are readily available, unlike much other desirable information, even today, and they reflect the organisation of the industry in summary fashion by bringing together a number of its main participants—the building owner, the architect and other professionals, the contractor and sub-contractor—showing them in various relationships according to the form adopted. Probably the main participant not to feature so prominently in most cases is the building worker, sometimes with the trade union in the background. Many building materials suppliers, too, though so important, are often in the background.

Architects and Innovation in Building

Innovations in building contracts began *circa* 1960 for the most part but were of small scope until the 1970s. The Department of the Environment has not published statistics of their use and value. A private survey in 1984 by the Centre for Construction Market Information listed "the top 16 management contractors" and showed that the number of firms offering that arrangement increased from three in the 1960s to five in 1970 and to 44 'national contractors' by 1984 [1]. A further survey by the Centre shows that design-and-build contracts and management contracts together probably covered about a quarter of all new non-housing construction in 1985: 15% by means of the former and 10–12% by the latter. It appears that the top 20 management contractors accounted for 90% of the total value of that type of contract while the

* The article is directed towards building rather than civil engineering. However, for various statistical and analytical purposes a sharp distinction cannot always be made.

leading 20 design-and-build contractors carried out 65% of such work. Design and build was found to involve "a much wider number of contractors" than management contracts and "only 46% of design-and-build contractors appeared to be involved in management contracts in 1986". The survey covered 105 contractors, about eight of whom no information was obtainable, and among whom 39 were found to have been involved in design-and-build work in 1985–86 [2].

These innovations in contracting can be better understood if one puts them in the setting of several features of the post-war building industry which distinguish it more or less sharply from earlier times. The first observation concerns the confidence and optimism of architects during the first two decades or so after the end of the war. Some of them—and they included many of the leaders of the profession—had come to see the responsibilities and tasks of architecture and building in broader terms than had been at all common previously. For example in 1964 Sir Robert Matthew as president of the Royal Institute of British Architects looked to the future:

> The whole face of Britain is being changed, existing towns and cities ... will be changed out of all recognition ... it is the architect, more than anybody else, who will give these new buildings, and the towns and cities, their shape and character. [3]

Such high expectations of architecture have been less common in recent years. If anything, an excessive pessimism and caution about innovation and change seem to have influenced public opinion and perhaps even architects themselves.

The building work which Sir Robert Matthew was envisaging obviously implied large demands upon the talents and material resources of the industry and the economy. In view of the mood of optimism of that time, it is sobering to note that the productivity of the industry had not yet recovered from the decline which set in during the war years. It has been estimated that the recovery was not accomplished until the end of the 1960s, much later than in other industries [4]. The trouble seems to have arisen partly because of abrupt changes in the pattern of demand arising from the needs of war—for instance, hardly any houses were built compared with the large concentration on housing in the boom of the 1930s—and partly because of shortages of materials. It was sustained after the war by the continuing shortage of labour (compared with the pre-war situation), in circumstances of full employment; this was a great difficulty for an industry which was still labour-intensive and which had achieved its pre-war efficiency in reducing costs by means of an abundance of mobile labour and cheap materials.

The decline in the industry's efficiency gave rise to official concern soon after the war, especially in respect of housebuilding in a situation of extreme shortage [5]. Government interest in the cost of building prompted various forms of intervention. These ranged from administrative pressure by such means as the cost yardstick applied to schemes proposed for local authority housing, schools and hospitals, to the setting up of the National Building Agency in 1964 (abolished in 1984) to encourage innovations in building methods, materials and procedures by means of information, advice, and the issue of certificates of approval for new products such as industrialised system-built flats and houses (of which there were over 100 on offer by the contractors in the mid-1960s).

Generally speaking, innovation was seen as the way to reduce the costs and raise the output of the industry. It was not thought feasible to solve the problem by recruiting more labour, shortage of which was particularly acute on inner-city building

sites; obviously that would have led to sharply rising wages and costs. But more efficient management of the existing labour force could help. Indeed, better management is probably one of the main causes of the recovery of the productivity of the industry by the end of the 1960s. The other is likely to have been what was broadly called industrialised building. This expressed a concept which was congenial to the Modern Movement in architecture although by no means exclusive to it, as has been shown by Swenarton and Finnimore [6]. It was promoted as part of the rationalisation of design and construction which was one important element in Modern Movement thought. (The other element, the belief that architecture and building were activities in the service of society, not simply the client, had not been absent from earlier thinking about the responsibilities of the architect, but had been less emphasised by architects and their clients for whom the aesthetic significance of the architectural styles was more important.) The great potential for industrialisation of building was suggested, for instance, by Henry-Russell Hitchcock's pointed observation in 1954 that the proportion of factory-made parts in the Crystal Palace was greater than in the majority of buildings a century later [7]. The point seemed clear. If the economies of mass production which had reduced the cost of cotton and motor cars could be achieved in building, ample means should be available to realise the plans and fulfil the hopes of the architects and the community, not to mention the politicians and the contractors. The most striking outcome of this thinking was, no doubt, the mass production of high-rise flats, assembled rapidly from concrete units made in plants at a distance, preferably where labour was more abundant and cheaper. But the attempt to shift production away from the building site into the factory extended much more widely and of course still continues. Like all innovation, it raised the risk of failures. The past 20 years or so have been marked by the emergence of what appears to be an unprecedented frequency of failures of processes and materials in building.

Geoff Scott in 1976 provided a sober and well-judged analysis of a serious situation, the full effects of which have not yet materialised [8]. But it is clear already that billions of pounds of costs provide the measure of the failures of the attempt at rapid innovation. Buildings, from flats to shops and offices, which were planned to have lives of upwards of 60 years are seen to be in need of expensive repairs, refurbishment, or demolition after only 20 years. Such failures were uncommon in earlier times when techniques were conservative and when, from the middle of the last century, they were subject in use to supervision by the building inspectors of local government.

The evidence of costly failures, and the fear of more to come, are now very plain. The Association of Metropolitan Authorities for example has drawn attention to its survey-based estimates of the costs of repairing various parts of the stock of public housing, ranging from early postwar houses built by new systems to the industrialised housing of the 1960s—some of which, as we know, has been demolished already. They have estimated the cost of repairing system-built high-density housing at £5000 billions [9]. Much or all of this is a premature expense and thus a sign of failures.

Within the building industry, who were the greatest sufferers from these setbacks? In the long run it was the architects, as a profession if not as individuals. Individual contractors of course suffered financially and, for a time, in reputation. But there is little to suggest a wider loss of public confidence in the contractors. Architects and architecture, in contrast, were often severely—and unfairly—blamed. After all, architects headed the building teams, as their spokesman had so often emphasised and as was implied by Robert Matthew's stress on the contribution of architects to the

rebuilding of Britain. If designs were unsound and materials and workmanship not up to standard, it seemed that the fault must lie with them. Even when, as might happen, litigation showed that the fault lay elsewhere (e.g. with the contractor) in public opinion the architect as the person in charge was pretty sure to suffer. Journalists seldom spared the architects when reporting or commenting on building failures. Architects could retort, and did, that lack of money led to poor building. Like Kenneth Campbell, they pointed to cheeseparing by government [10]. They also pointed to commercial pressures, including high and rising land values, which severely constrained the architect who, in the spirit of the Modern Movement, wanted to serve not Mammon but society. But these reflections, from the mid-1960s onwards, came too late to shield the architects from reproach. Indeed, reproach could come most severely from within the profession, as the Report on the partial collapse of Ronan Point in 1968 showed:

> In the broadest sense, it could be argued that the two major professions concerned—architects and structural engineers—have been found wanting, the former for their failure to call adequately upon the latter and the latter for failing to take much interest in system building generally. [11]

One of the casualties of building failures was the Modern Movement itself, although other social and aesthetic influences, including the advantages of changes of fashion in a competitive, commercial setting, were probably also involved. Lord Esher, himself a leader of the Modern Movement, has written with understanding and compassion about its decline as "the collapse of social idealism into bureaucracy hedged about by Byzantine codes of procedure and brutal cost yardsticks . . ." [12]. He quotes with approval the architectural journalist, Malcolm McEwen, denouncing ". . . badly fitting buildings, grotty concrete steps, cheap twisting aluminium trim, rough precast concrete panels, like giants' breakfast food, thin broken plastic infill panels—the whole unclean and uncleanable, unloved and unlovable, the architecture of greed and carelessness" [13]. While one sympathises with the architects, it is worth remembering that the cost yardsticks were worked out and administered in central government by teams of specialists which included architects.

The loss of reputation is clear. But perhaps architects as a profession have not suffered much permanent damage. Is their long-term position in the industry unimpaired? Are they still, in short, the acknowledged leaders of the building teams? The developments in building contract arrangements and the arguments used in support provide evidence since, as I have argued, they express the different relationships between the various members of the 'team'. Also, since the contract is an important commitment, not least in its legal implications, no-one is likely to attempt innovations in its form without strong reasons and after careful consideration of alternatives and consequences. Therefore, the introduction of such contracts as the package deal or design and build contract and the management contract should be seen as a substantial response to fundamental difficulties.

The Professionalisation of Architecture

As I acknowledged at the outset, contracts, like all sources, have their limitations as evidence. In particular, there are the questions, what is the actual meaning of the contract in terms of relationships and activities and was it carried out? Shylock's experience with his demand for a pound of flesh makes that point. Contracts in the

building industry have always had a difficult, even ambiguous, relationship with the work that was actually done. It is not at all easy to reduce all the requirements of even quite a simple building to a perfectly clear plan and specification and bill of quantities. For a long time it had been the particular responsibility of the architect to cope with this problem and then supervise the carrying out of the work [14]. There was therefore long established precedent in 1903 when the Royal Institute of British Architects published its first official standard form of contract in which the preeminence of the architect was made clear. In 1939, this responsibility for supervision was described in the Introduction to the First Edition of *The Standard Forms of Building Contract* as an "almost autocratic control of the actual execution of the contract works . . ." [15]. The contractor was cast as the architect's subordinate, even to the extent that the architect had a responsibility of quasi-adjudication between the claims of the client and the contractor. This was considered acceptable because not only was the architect himself not a party to the contract, which was between his client and the builder, but he was not, like the builder, 'in trade' in his own commercial interest but was in practice as a professional, subject to restrictions on the pursuit of self-interest.

The professionalisation of architecture was important to the rise of architects to their postwar position of preeminence and high public repute. It began in the course of the later eighteenth century when, as H. M. Colvin remarks, the ebb and flow of English taste took design beyond the competence of the architect/builder with his roots in a trade and a pattern book in his hand, and required the more sophisticated knowledge of men who had the benefit of training in an architect's office with, perhaps, the stimulus of direct observation and study of the classical architecture of Greece and Rome [16]. Sir John Soane, as early as 1788, saw the need for a separation of the architect from the building contractor to safeguard the high standard of building in the interest of both the client and the practice of design [17]. So began the development which led, through the Institute of British Architects of 1834 ('Royal' from 1866), to a body of professionals who undertook to eschew competition in terms of the level of fees, the poaching of colleagues' clients, and engagement as entrepreneurs in commercial building, and to confine competition to achievement in design and competent supervision of work. Competitions for the design of buildings became a distinctive expression of this ethos. In 1862 the Institute established a system of examinations which in 1887 became compulsory for associate membership.

But professionalisation was a slow process. Many who worked as architects did not see it as worth their while or were even hostile [18]. From the foundation of the RIBA in 1834 throughout the nineteenth century only a minority of those practising as architects were members of the Institute [19]. As recently as the Architects' Registration Act of 1938, as Frank Jenkins points out, the designation 'Architect and Builder' remained 'not uncommon' [20]. Of course such a designation precluded membership of the Institute. In the 1938 Act the force of law was needed to restrict the use of 'architect' to people whose qualifications satisfied the Architects' Registration Council —and thereby the RIBA which had for long campaigned for professional standards [21]. Even after 1938, anyone could continue to offer to design buildings so long as they did not call themselves architects.

Looking back, therefore, on the development of architectural aspirations and practice we can see that anything like a comprehensive establishment of the profession is really a very recent occurrence. It coincided with, but was not caused by, the emergence of the Modern Movement in Britain in the 1930s with its wide-ranging social commitment, such as Sir Robert Matthew was articulating. This advance of

professionalisation in architecture was important both as a source of confidence for the young men and women who as pupils and students and young practitioners in the 1930s and 1940s were inspired by the new movement, and as an assurance of altruism as well as competence to others concerned with building: private clients, politicians and councillors, civil servants, journalists and concerned opinion in general. In our increasingly bureaucratised and collectivised society professional status enhanced the authority, and therefore the autonomy, of architects. Such independence was a particularly valuable asset to those architects who were advocating and taking responsibility, not merely for a new style, but for bold innovations where the level of uncertainty and risk of failure were necessarily high.

The Rise of the New Contracts

The halcyon days of full professionalisation were brief. As Malpass has shown, the postwar period was a time of large increase in the proportion of architects who were not independent practitioners but salaried employees, especially within local government. Despite the survival of professionalism as an ideology among them, the bureaucratic organisations in which they work have tended to disperse decisions about building projects among a variety of other specialists, thereby depriving the architects of that grasp of the problem of a building as a whole and its solution which is an essential condition of full professional practice and responsibility [22]. For the independent practitioners the new contracts we are considering may point to a similar reduction. These newer contracts have been identified by Franks and together with the longer established system can be summarised as follows [23].

The Traditional System

Estblished in the course of the nineteenth century; a fixed price contract is awarded to the lowest bidder for work previously designed by the building owner's architect, who also supervises construction. Payment may be either by a lump sum or by measurement and fixed prices.

Design and Build Contract: package deal contract

The contractor offers a complete service of design and construction which makes it unnecessary for the customer to appoint an architect (although he may do so). In the design and build version the contractor offers to provide whatever kind of building is required by means of an original design; package deal contracts usually refer to an already designed 'system' building, generally composed of prefabricated elements. Under a *Turnkey Contract* the service is taken further and may include provision of land, finance, leasing and other items.

Management Contract

The building owner's architect prepares preliminary plans, sufficient for a contractor to agree to manage the work for a fee, advise on further design and construction methods, arrange contracts with sub-contractors, and co-ordinate and supervise the work in collaboration with the architect and the owner's other professional advisers. (Note that the contractor may have recommended the architect to the building owner.) Under *Professional Construction Management* (originating in the USA) collaboration is intensified by means of a project team formed from the owner, construction management and the design organisation.

It is possible that these new forms of contract would have developed even in the absence of the difficulties of the past two decades—indeed some of them were

invented and introduced much earlier, but not much used; but the rate of their advance has probably been faster because they have been seen as remedies for the weak, unreliable co-ordination of the stages of the building process which had become a theme of criticism, enquiry and suggested remedies by the 1960s. Under the main established standard contracts efficient integration depends fundamentally on the architect's capacity to understand the client's needs, express them in a design conception, obtain a competent builder and then adequately supervise his work. The weakest point has come to be seen as the disjunction between the processes of design and construction. It was often realised that a better job could have been done if the builder had been involved with the client and his architect from the outset so that he could contribute his specialised knowledge of processes, materials, and management problems and practices.

This awareness, together with concern to raise the output of the industry to meet the expected needs of rapid growth of the economy, led in 1962 to Sir Harold Emmerson's *Survey of Problems before the Construction Industries*, prepared for the Minister of Works. Among other points, his short but wide-ranging and influential report remarked:

> In building there is all too often a lack of confidence between architect and builder amounting at its worst to distrust and mutual recrimination. Even at its best, relations are affected by an aloofness which cannot make for efficiency, and the building owner suffers. In no other important industry is the responsibility for design so far removed from the responsibility for production. [24]

Emmerson noted also that the civil engineering branch of construction did not suffer from this problem. Another unsatisfactory feature which was held to influence relations in the building industry was the restrictions imposed on the freedom of movement of architects and surveyors by their professional status. Unlike the members of the Institution of Civil Engineers, architects and surveyors were not allowed by their institutions to engage in contractual work, except as employees. He continued, "If the architects and surveyors wish to retain these restrictions on freedom of movement some alternative way must be found of bringing about closer contact between builders and their professional associates" [25]. Emmerson led on to Sir Harold Banwell's report on *The Placing and Management of Contracts for Building and Civil Engineering Works* (1964) [26] and that in turn to *Action on Banwell* (1967) by a committee of the National Economic Development Council, followed by a further NEDC report in 1983 on *Building* which showed that small progress had been made [27]. In 1966 a Report of the Tavistock Institute by Gurth Higgin, Neil Jessop and others had analysed and revealed the existence within the context of the necessary interdependence of the participants, of a number of sources of costly uncertainty, including the divorce of design from construction, and had suggested remedies such as the package deal [28].

The first radical unification of design and building to be at all widely used was accomplished by the package deals devised to market the systems of industrialised flat building which were so rapidly introduced in this country during the 1960s. Architects, engineers and surveyors were employed by the contractors. Obviously the contractors could claim to have the specialised knowledge of the construction and design applications of their products. Although the local authorities who were the customers also employed professionals, the concept of the 'package' tended to restrict their involve-

ment in both the design and construction processes in view of their lack of knowledge of the particular system employed. The issuing of certificates of approval by the government-sponsored National Building Agency (set up in 1964 to encourage greater efficiency) gave confidence in the new systems and made close analysis seem less necessary. The Report on Ronan Point found this to be a weakness in the carrying out of the contract for that building.

Despite this unpromising start, the design and build contract has been found to be well suited to certain kinds of building; for instance, it is said that warehouses and the less complicated kinds of factories are built quickly and to well predicted costs with design and build contracts. Similarly, large contractors offer local authorities schemes of shop development, with the services of their architects and other specialists. There is no necessary place here for the independent architect.

The effect of the management contract on the architect's position need not be so sharp, although these contracts may include contractor's provision of all or part of the design. But even when a management contract involves co-operation by the contractor with an independent architect appointed by the customer there is still the important difference from the standard form of contract that the contractor appears on the scene at a significantly earlier stage in the process of decision making.

The architect still has responsibility for ensuring that the plans are carried out satisfactorily. But after such close co-operation with the contractor at the design stage the relationship looks much more like a collaboration of equal partners than the one between leader and follower which architects have believed to be so important. Among other things, this collaboration facilitates continuance of the design process after building has begun and, if well managed, can reduce the total period of design and construction, with large savings to the building owner. On the other hand, it is said that the reduction or elimination of competition to build an already designed scheme tends to raise the cost to the owner. In any case, the survey referred to at the outset of this discussion does indicate the attractiveness of the management contract, whether with or without contractor's design.

Conclusion

Where do these developments leave the architect? In the first place, most work is still being done under the traditional system, in the form of Joint Contracts Tribunal Standard Form of Contract 80—and also its predecessor, JCT 63—and under a simpler contract, Intermediate Contract 84, designed for smaller works. The RIBA have also, through their participation in the Joint Contracts Tribunal, finally agreed to a modification of the Standard Form to allow for Contractor's Design. If that was all they had done, it might be said that the profession had suffered an uncompensated loss of status and, very likely, income. But in fact they have adapted with agility to the new situation. The Code of Conduct was amended in 1984 to allow architects to be directors of firms in the building industry, including property developers, and not merely employees, as before. They are also now allowed to advertise and to use the crest of the Institute. Another important change has been made in their Conditions of Appointment since 1982. As a result of criticism of the mandatory scales of fees by the Monopolies Commission, scales are now merely recommended and no scales at all are set for work under £20,000 in value. So competition in fees is now permissible or tolerated, although scarcely encouraged by the Institute. In short, the profession has rapidly acquired some of the commercial, market centred features which have always

been prominent in the often hectic lives of the contractors. Whether even its most enterprising members will in fact be able to make much use of these new opportunities is of course uncertain. If the management and design-and-build contractors press on successfully with their design services, their assimilation of the architects as employees will obviously be even greater. The way to the top will more than ever be through their organisations. But of course we are now talking about the future. As to that, the architects have been resourceful and adaptable in the face of their problems of the past 10 to 20 years.

In any case, on the issue of their function and status do they really mind whether they are to continue to be the leaders of the building team? In 1985 at a debate by architects organised by the North East Thames Architectural Society, the RIBA President-designate, Larry Rolland, put the case that "The architect must lead the building team"; "With an audience dominated by bow-tied architects" the motion "just scraped home by two votes" [29]. We are left with the question, to which the new contracts attempt an answer, have better means to achieve sound building been devised? The next two decades are likely to confirm or reject that answer. In doing so, they are also likely to reflect the extent of society's appreciation of quality of design and not simply of price.

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References

[1] Reference Centre for Construction Market Information, 'Survey on management contracting' (Feb. 1985), reported in *Building*, CCXLVIII no. 9 (1 March 1985), pp. 30–1.
[2] Centre for Construction Market Information, reported in *Building*, CCLII no. 5 (30 Jan. 1987), p. 13.
[3] Sir R. Matthew, foreword to D. Senior, *Your Architect* (publ. in association with the Royal Institute of British Architects, 1964).
[4] R. C. O. Matthews, C. H. Feinstein & J. Odling-Smee, *British Economic Growth 1856–1973* (Oxford, 1982), p. 236.
[5] Ministry of Health, *The Cost of House-building* (1948).
[6] M. Swenarton, 'Homes fit for Heroes: The Policy and Design of the State Housing Programme of 1919' (Ph.D. thesis, University of London, 1979), ch. 11 and Conclusion; B. Finnimore, 'The Industrialisation of Building' (Ph.D. thesis, University of London, 1986), ch. 4.
[7] H.-R. Hitchcock, *Early Victorian Architecture in Britain* (2 vols, 1954), I, p. 542.
[8] G. Scott, *Building Disasters and Failures* (1976).
[9] Reported in the *Guardian* (7 March 1984), p. 3.
[10] K. Campbell (Principal Housing Architect, Greater London Council), Bossom Gift Lecture, reported in *Building*, CCXVII no. 27 (18 July 1969), p. 114.

[11] *Collapse of Flats at Ronan Point, Canning Town, Report of the Inquiry* (HMSO, 1968), p. 53.
[12] L. Esher, *A Broken Wave* (1981), p. 86.
[13] Ibid., p. 86.
[14] Compare *Chambers Universal Cyclopaedia and Dictionary* (1743).
[15] Sir D. Walker-Smith & H. A. Close, *The Standard Forms of Building Contract* (1963), p. xiv (quoting their introduction to the first edition, 1939).
[16] H. M. Colvin, *A Biographical Dictionary of English Architects 1660–1840* (1954), pp. 7–9.
[17] Ibid., pp. 24–5.
[18] F. Jenkins, *Architect and Patron* (1961), pp. 118 and 226.
[19] B. Kaye, *The Development of the Architectural Profession in Britain* (1960), table III, p. 175.
[20] Jenkins, *Architect and Patron*, p. 211.
[21] Ibid., p. 222.
[22] P. Malpass, 'Professionalism and the role of architects in local authority housing', *R.I.B.A. Journal*, 82 no. 6 (June 1975), supplement, pp. 6–29.
[23] J. Franks, *Building Procurement Systems* (Chartered Institute of Building, 1984).
[24] Sir H. Emmerson, *Survey of Problems Before the Construction Industries* (Ministry of Works, 1962), p. 9.
[25] Ibid., pp. 9–10.
[26] Sir H. Banwell, *The Placing and Management of Contracts for Building and Civil Engineering Works* (1964).
[27] National Economic Development Council, *Action on Banwell* (1967).
[28] G. Higgin & N. Jessop, *Communications in the Building Industry* (1963).
[29] *Building*, CCXLVIII no. 11 (15 March 1985), p. 23.

Abstracts of Periodical Literature

SIMON PEPPER

NICHOLAS ADAMS, **The Life and Times of Pietro dell'Abaco, A Renaissance Estimator from Siena (active 1457–1486)**, *Zeitschrift für Kunstgeschichte*, 48 no. 1 (1985), pp. 384–95. Maestro Pietro dell'Abaco was a mathematician and estimator, active on the major building sites of the Sienese Republic during the second half of the fifteenth century. This paper provides a professional biography of a figure whose workload embraced the teaching of applied mathematics, surveying, estimating quantities, measuring completed works and, on one occasion, acting as structural engineering consultant for the building of a dam. Data from the Sienese financial archives—the *Concistoro*, *Biccherna* and *Gabelle delle Contratti*—is used to give a comprehensive picture of Maestro Pietro's income and property, shedding much light on the status achieved by an early (non-architect) building professional.

NICHOLAS ADAMS, **The Acquisition of Pienza 1459–1464**, *Journal of the Society of Architectural Historians*, XLIV (May 1985), pp. 99–109. The transformation of the central Italian village of Corsignano into Pienza by Pope Pius II (Enea Silvio Piccolomini) required an elaborate series of property purchases. Through the discovery of hitherto unpublished notarial memoranda from the Archivio di Stato, Siena, it is now possible to consider the process of urbanisation as a distinct series of phases rather than simply as the result of papal will. These documents, recording the price paid for the property, its appurtenances, and the zone of the village in which it was located, reveal that the Pope developed different areas in sequence. Purchasers with a variety of relations to him and the Piccolomini family tended to buy in different areas. With these documents it is possible to begin to consider the Pope's intentions at each stage. It is also possible to use the documents to reconsider some traditional ownership attributions.

M. R. APTED, **The Building and other Works of Patrick, 1st Earl of Strathmore at Glamis, 1671–1695**, *The Antiquaries Journal*, LXVI part 1 (1986), pp. 91–115. The Glamis *Book of Record* was written between the years 1684 and 1689 and was intended, according to the Earl, to be a "Book of Record of all my transactions as debtor or creditor and with my Tenents & the effects of my estates And in a word of all my proceedings Beginning in the month of Januarie 1684, excepting my pocket money & petty desbursements". In fact it was much more, since it included the earl's autobiography . . . and describes in detail the planning and execution of his schemes for the improvement of his two estates, Castle Lyon (also known as Huntly Castle) and Glamis. As far as the latter is concerned the *Record*, together with contemporary documents preserved in the charter room there, constitutes a first-hand account of architectural and other developments at the castle . . . probably without parallel for any other building of the day in Scotland.