A true south for design? The new international division of labour in architecture

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This analysis shows how the increasing availability of computers in architectural practice and the steady development of electronic networks around the world could encourage the relocation of professional structures into countries with lower production costs. Starting from the existence of sharp professional wage differentials between developed and developing regions, it formulates the hypothesis that, in a few years, most architectural work could be documented in places such as South-East Asia and transferred digitally over to America, Australia or Europe.

When we hear the word globalization used in relation to architectural practice, we tend to think of the geographic expansion of professional markets. This is a process in which design structures located in one part of the world receive commissions that cross the geographic boundaries traditionally associated to that given architectural region and culture. Not that this is incorrect. In recent times, the mobile nature of capital, the use of building imagery as a primary tool of corporate communication, and the reorganization of production geographies (with the various infrastructural dis-equilibriums between developed and developing worlds), have all generated a substantial increase in the demand for, and the supply of, international design services. In Australia, for example, the export value of architectural services has grown by more than three times since the early 1990s, and it is currently estimated that 22% of the gross fees of Australian architects are earned offshore (RAIA, 1999:5). The Department of Foreign Affairs and Trade now recognizes that the architectural relationships between Australia and specific Asian nations – Indonesia, Malaysia, Singapore, Hong Kong and Thailand at present, Vietnam and the Philippines in the future – should be considered as part of Australia's export strategy (Productivity Commission 2000:48).

There are, however, clear signs indicating the parallel development of another type of globalization, lower-key and much less blatantly acknowledged than the first, this time relating to the division of labour internal to the design process. For a few years now, traces of a geographic separation between design activities have emerged amid the grounds of the architectural profession. In an increasing number of circumstances, design conception, production of working drawings, and site administration for the same project are carried out by components of the same organization located in different parts of the world. The many (but by-and-large anecdotal) examples include:

- US architectural firms opening design documentation shops in India, Indonesia and Mexico
- US engineering firms using draughtspersons in the Philippines and South Korea
- the Californian university outsourcing structural consolidation drawings to Czech office locations, the Singaporean firm farming construction tender packages out to Manila
- and more recently – in light of favourable currency fluctuations – Australian offices being contracted by Californian firms for the production of working documents.

International cooperation in building design is not new. The whole epic of twentieth-century architecture, with its supranational thrust, has been accompanied by temporary associations between foreign master (or foreign office) and local technical cadres. Le Corbusier and Louis Kahn are the quintessential examples of this arrangement with their projects in India, Japan and Bangladesh (eventually followed by Vinoly, Gehry, Rossi, Eisenman, and a panoply of other world-famous designers). The scenario suggested in the preceding section, however, combines two elements that are

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not part of this tradition. The first element is the relationship between the location of decentralized offices (or associated structures) and the (low) cost of local labour – a relationship that defines a geography of employment based on conditions of economic depression or economic underdevelopment. The second element is the structural character – i.e. not determined by the specific design commission – which informs these long-distance alliances.

The apparent correspondence between the places where such a division of labour seems more likely to occur and the areas of the world with high levels of construction activity could generate some confusion. When considering the dynamics of urban growth (or urban redevelopment) across the planet, it may look natural for many design organizations from the Western world to establish beachheads in South-East Asia or along the Pacific Rim. But the globalization of architectural markets and the globalization of design production are two different things. And, although they may occasionally take advantage of each other, they respond to different logics. In the first case, the internationalization of the office is aimed at facilitating the export of design services and the potential expansion of its serviceable territory. In the second case, it reflects the utilization of the international division of labour for lowering organizational and production costs internal to the architectural firm.

The discreet charm of wage differentials

The ability to tap into labour markets in industrially depressed or developing regions yields clear competitive advantages. In 1996, an article in *The Economist* ('Sliding Scales', 2 November, p.17) showed that, while hourly compensation in the US, UK and Australian manufacturing sectors oscillated between US$13 and $17, labour costs in Malaysia, Mexico and the Czech Republic were set below two US$2 per hour. Philippines reached 70 cents; Thailand, Indonesia, China, and India were all well under 50 cents (Parker, 1998:321). The study did not, however, consider social costs. A 1992 analysis of the clothing industry which took the latter into account, found that hiring workers in the UK was 50% cheaper than hiring them in Denmark, Germany or Northern Italy, but 10 times more expensive than in Malaysia and Sri Lanka, and 100 times more expensive than in India or Vietnam (Parker, 1998:324).

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Official comparisons between design professional wages in advanced capitalist societies and developing regions are hard to come by. In 1992, a specialized study restricted to six countries reported that, on average, the annual salary of an electrical engineer in Belgium or in the US was over three times that of her counterpart in Hungary, and almost twice the remuneration expected by a South Korean engineer (Parker, 1998:323).

Yet empirical information being gathered with the help of Melbourne University students [Table 1] indicates that professional wage differentials between 'developed' and 'developing' worlds can be more pronounced, and reach similar proportions to those found in manufacturing.[1] At current exchange rates, for instance, an experienced Indonesian architect working in a large firm in Jakarta is

TABLE 1 **Professional wage differentials between the 'developed' and 'developing' worlds**

	United States	Australia	Indonesia	Sri Lanka
Projected paid workforce (million) in 2010[a]	154	10	125	9
Labour costs ($/hr) in manufacturing, 1995[b]	17.20	14.40	0.30	1.59
Purchasing Power Parity Index %, (PPP) 1998[c]	100	100	39	29
GNP per capita in PPP dollars, 1999[d]	30,600	22,448	2,439	3,056
Private consumption per capita in PPP dollars, 1998[e]	21,515	14,890	1,701	2,103
Architects' hourly wages (Aus$)[f]	32.00/44.00[g]	26.00[h]	2.50/5.00[i]	3.00/5.80[i]
Draughtspersons' hourly remuneration[f] (Aus$)	–	18.00[h]	by drawing	1.20/2.60[i]
Graduates' hourly remuneration[f] (Aus$)	20.00/22.00 g	11.00[h]	1.30/2.50[i]	1.00/2.00[i]
Average rent for class 1 office space (US/sq m/month)[l]	24/37[m] (Los Angeles)	38 (Sydney)	14 (Jakarta)	6 (Colombo)

[a] World Table, The Macmillan Atlas of the Future (Ian Pearson Ed.), New York, 1998.
[b] Parker B., 1998, Globalization and Business Practice, p.321.
[c] World Bank, 2000, World Development Indicators, Relative Prices in PPP Terms, 4.12.
[d] World Bank 2000, World Development Indicators, GNP per capita 1999, Atlas Method and PPP.
[e] World Bank 2000, World Development Indicators, Structure of Consumption in PPP Terms, 4.11.
[f] These data are only indicative because they come from different sources and use slightly different parameters, but still highlight the large geographic gaps in professional remuneration.
[g] AIA, American Salary Survey, 1997 data.
[h] APESMA, 1997 data.
[i] Data collected independently, 2000.
[l] Brooke International, November 1997 data.
[m] Churchill Mortgage, Los Angeles.

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expected to earn between Aus$3 and $5 per hour. This can reach almost $6 per hour in the Sri Lankan capital of Colombo (where, however, a very experienced draughtsperson in practice for many years is not going to earn more than 40% of that amount). By comparison, the starting salary for an architectural graduate in the US was over US$10 per hour in 1993 (CSPA, 1994); this translates to about Aus$14 at the time, and over Aus$20 at current exchange rates. In 1997, the American Salary Survey administered by the American Institute of Architects showed that, on average, experienced and senior architects were expected to earn between US$16 and $22 per hour – at least six times more than their Indonesian and Sri Lankan colleagues, when considered vis-a-vis present currency values (AIA, 1998).[2] Australian practice shows a similar pattern. The average starting salary for a graduate in 1997 was Aus$11 per hour, senior architects earned up to over Aus$26 per hour, while documentation specialists commanded over Aus$18 (APESMA, 1997).

The import of these salary scales can be gauged by considering architectural office budgets. According to recent surveys of the Royal Australian Institute of Architects, labour costs account for over 50% of the annual operating budget of Australia's most efficient architectural firms (Carino, 1996; Draganich, 1999) [Table 2]. Extrapolations from the same set of data indicate that a 20% reduction in wages could yield up to a 50% increase in trading margin.[3] Within the framework outlined, transferring design documentation tasks from Australian to Indonesian establishments would allow Australian firms to cut their overheads dramatically and achieve multifold gains in net revenues.

Labour costs, of course, cannot be regarded in isolation. The hypothetical relocation of professional tasks in lower-wage areas implies rent of premises, purchase of equipment and increase of transactional activity, all of which carry their own cost. One should consider, however, the relative weight of these items in the office budget, and the possibility that some of them help achieve additional savings. Rent of premises, for example, accounts for 7-15% of office costs. At the end of 1997, prime office rental values in Jakarta were slightly over one-third of those in Sydney, resulting in a difference of US$24 per square metre per month between the two real estate markets (Brooke International, 1998). Labour savings, in this case, could be integrated with significant savings in capital costs.[4] Equipment, travel and communication expenses together, on the other hand, make up only one-sixth of labour costs (Draganich, 1999). This means that even the doubling of such expenses would be absorbed by a 20% reduction in wage levels.

TABLE 2 **Budget percentage distribution in Australia-based architectural firms with 11/20 employees**

Labour expenses	**58.0**
Employees and long-term contractors wages and salaries	48.0
Short term contractors and subcontractors	1.5
Superannuation, leave, fringe benefits, etc.	8.5
(Staff training	0.4)
Premises	**11.0**
Rent or lease of premises, rates and taxes	7.0
Electricity and gas, repairs, maintenance, cleaning and security	1.6
Telephone and facsimile	2.4
Equipment (and vehicles)	**9.8**
Lease payments and depreciation (including vehicles)	5.6
Stationery, postage, printing, photocopying	4.2
Legal and administrative costs	**11.2**
Accounting, legal and consultant fees	5.6
Insurance	2.8
Other	**2.8**

'... on average, experienced and senior architects were expected to earn between US$16 and $22 per hour – at least six times more than their Indonesian and Sri Lankan colleagues ...'

Connections in places

Employment strategies such as those suggested above have been part of the managerial cargo of large US engineering firms at least since the 1960s (Housley Carr Krizan, 1988). What makes them worth discussing today is that their social and technical implementation is being rendered much easier by cheaper and widely available (or increasingly available) telecommunications infrastructure and convergence technology. Fibre-optic network connections have not only reached every industrial labour region in the world, but are rapidly expanding in developing countries, where government agencies are being set up to address, specifically, technological barriers to trade[5] (Industry Commission, 1998; Productivity Commission 1999) [Fig. 1]. International telephone costs and satellite utilization charges have fallen tenfold between 1970 and 1990 (year by which the price of fax machines had dropped to 25% of what their cost was in 1980) (World Bank, 1995:51). Within this context, it is not surprising to read that the percentage of firms transferring drawings electronically has risen dramatically, at least in the US, where it grew from 35% in 1996 to 83% in 1999 (Dalal, 2000b).

The socio-technical leap spurred by Information Technology is critical and must be highlighted. Traditionally, it was difficult for architectural practice to set up a true geographic division of labour in order to take advantage of wage differentials. The uncertain and interdependent nature of the building process requires architects to feed project participants with architectural and construction drawings for constant discussion and modification. This explains the spatial proximity between the architectural front office and the

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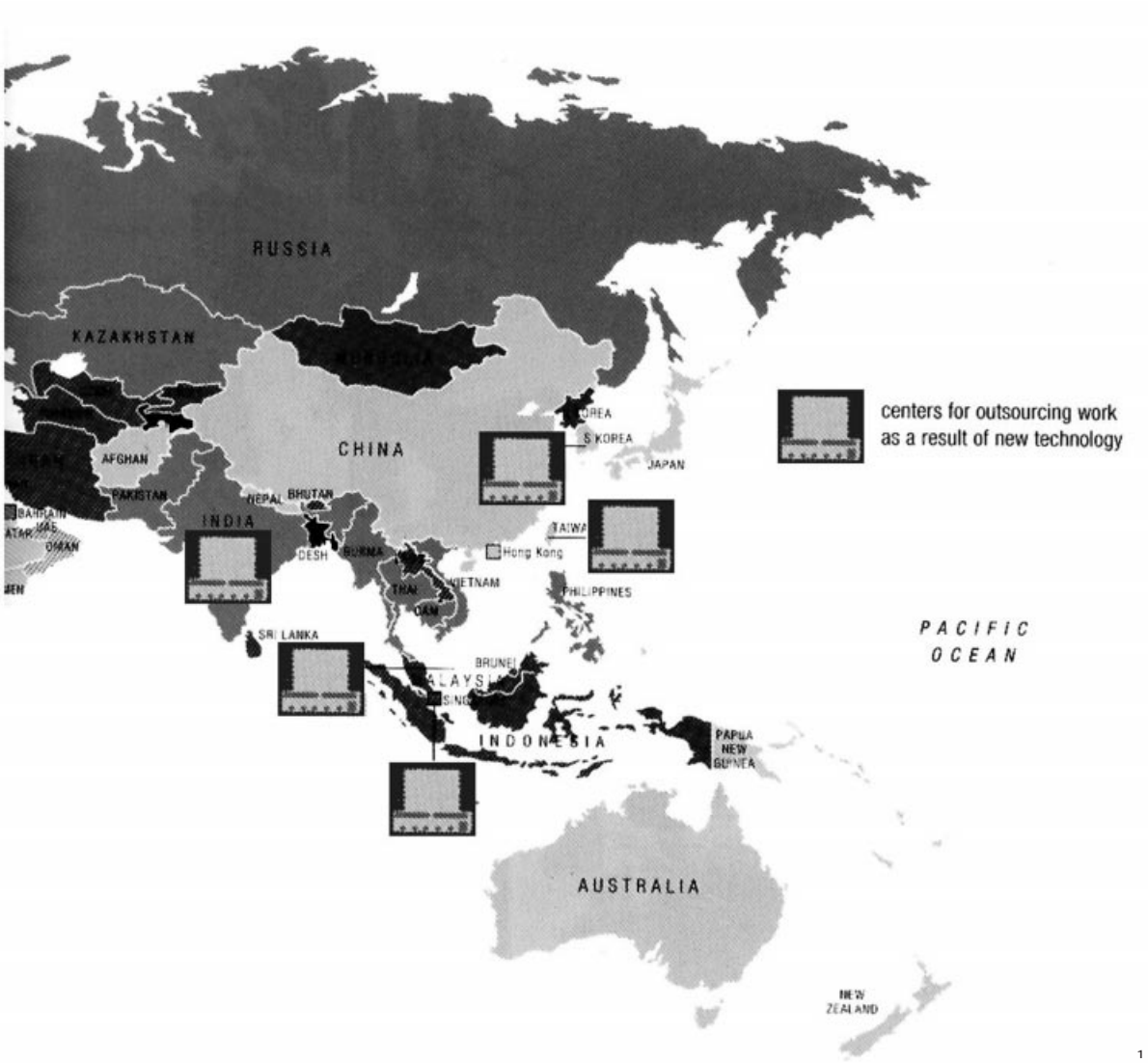

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draughting room, or between the draughting room and the construction site. Historically, architectural firms seldom operated beyond the territorial limits defined by their physical transactions (essentially the space allowing drawings to be exchanged in a reasonable time between architect, client, suppliers and construction people). Invariably, limits were expanded by establishing a satellite office or associating, on equal grounds, to a 'local' firm in charge of documentation and site administration. Consequently, the distinction between rich 'north' and poor 'south' in architectural practice could never be truly geographic other than metaphorically. Colonial undertones were present in the terminology used at the Ecole des Beaux Arts in Paris in the 1850s, where the students from the early years, at work on the submission drawings of their older colleagues, were colloquially referred to as *negres*, or negroes (Van Zanten, 1987:133). The term transferred over to Beaux-Arts-influenced institutions around the world, where the term 'niggering' became synonymous with working for a senior (and thus more powerful?) student (Scott Brown, 1978:32). Professionally, the role of the 'architectural negro' has been played by different groups: interns or students in large US cities, offices of recent graduates and women architects in Italy;

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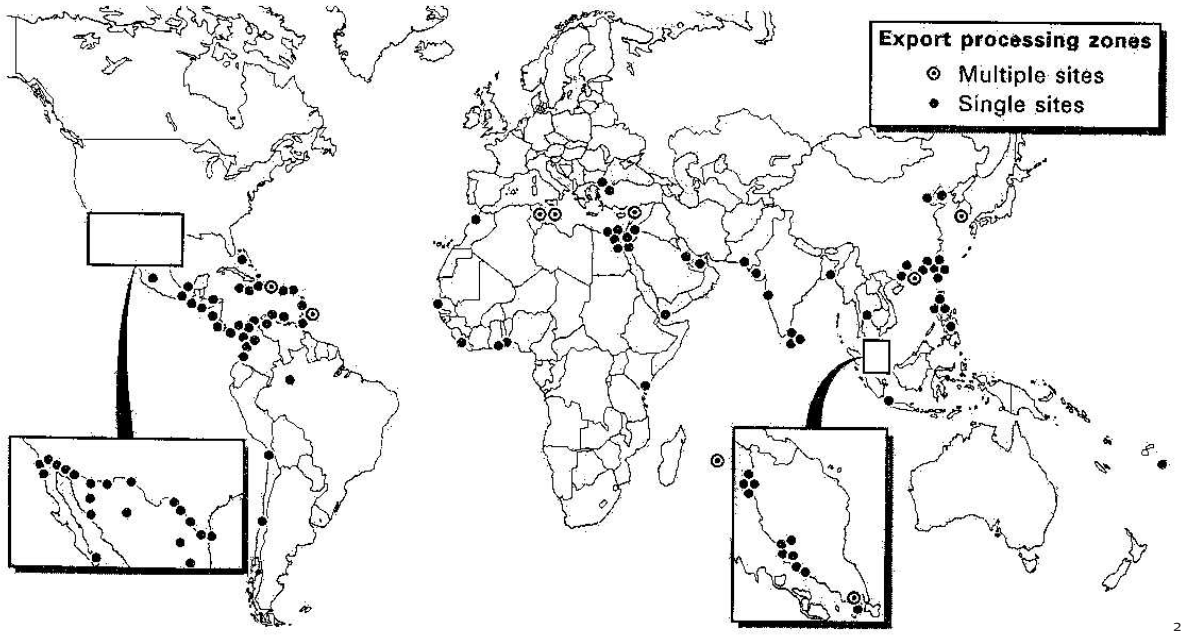

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1 Five of the six major centres for outsourcing work as a result of new technology. The sixth, not shown on the map, is Ireland. Fibre-optic networks are rapidly expanding in developing countries and communication costs have dropped dramatically

2 Export processing zones in developing countries. New technologies have redirected work towards self-disciplined or hierarchic societies with large workforces and low labour costs

retired draughtsmen and again women architects in Japan, and so forth.

Today is different. Although computer draughting allows for a more efficient standardization of notational practices (possibly reducing cultural differences between distant design operators), electronic links now enable the transfer of files/documents across space in a matter of seconds, thus obliterating the need for physical contiguity between areas of drawing production and areas of drawing definition-and-use. As the chief economist of the AIA writes, 'finally many firms have begun to operate in the global economy. Not only are an increasing number of firms – particularly larger firms – pursuing international opportunities, but firms are also effectively using an international workforce to supplement staffing needs. With the standardization of CAD software and the ability to access information electronically through the Internet, a design team can collaborate remotely much more easily at present' (Baker, 1999).

This very same element enables the (limitless?) extension of the work day. The product of daytime activity in St. Louis can be (and is in fact) transferred – at night – to India's mornings, and so forth in a theoretically endless loop. As William Mitchell aptly points out: 'The combination of rapid electronic delivery with convenient time zone differences allows an effective new form of 24-hour shift work. International architectural and engineering design firms can, for example, establish offices in cities approximately eight hours apart, then electronically hand off CAD files from one to the other in a continual circle around the globe' (Mitchell, 1999:102).

In its own right, this labour scenario fits the socio-industrial framework of the host region. In areas pressured by high demographic growth and labour oversupply, the use of local resources by non-local structures increases demand and generates income that is comparatively acceptable (when not competitive) for the society in which it gets consumed. In *The Work of Nations*, Reich gives the example of the Manila-based data-entry operators of Saztec International (a data-processing firm with headquarters in Kansas City), whose annual earnings of US$2650 placed them 35% above the average Philippine income (Reich, 1991:210). Other authors have reported that, in China, workers contracted by foreign firms can earn 2.7 times the pay of the same-skill level workforce employed by national firms.[6] On a much smaller but equally significant scale, a number of US design firms with offices in Mexico

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City are gaining notoriety for taking promising graduates and young employees from local firms, whose salaries cannot compete with those offered by foreign organizations with non-Mexican markets and fees.[7]

Industrial paradigms and geographic shifts.
What this hastened description seeks to suggest is that the globalization of design is the result of a clear economic logic. The strategic decentralization of labour, achieved largely through the use of new information-production and information-transfer technologies, allows those parts of the profession that are willing to walk this path to achieve three goals:

- to tap into a global pool of human resources that are either underutilized or in excess
- to reduce business costs
- to increase internal market competitiveness.

But does this logic have anything to do with architecture? The globalization of design that I have described may appear to be nothing more than another version of that socio-economic model which thrives on capital mobility and revolves around the unbalanced relation between the various economic norths and souths of the world.

Yet globalization may be set to have a significant impact on architectural practice as we know it. The access to non-local reservoirs of technical labour could interrupt the traditional, self-regulating mechanisms of the profession and, in particular, the natural distribution (or redistribution) of work that characterizes closed economic systems. The wearing away of physical regional boundaries may well determine the ability of any architectural office to shop around (the world) for professional skills – generalist as well as specialized – at more advantageous conditions than those of the local market (inevitably tied to the local cost of living), and in larger numbers. If one applied the figures provided by the Australian Bureau of Statistics (ABS, 1993) to the structure of practice delineated by the RAIA (Draganich, 1998) and the rates of remuneration reported by APESMA (1998), the Australian profession could experience the relocation of up to 6000 jobs between architects and draughtspersons, and a loss of Aus$280 million per year in local salaries.[8]

The history of industrial geography – from automobile to textile and to electronics – bears witness to the ability of competitive imbalances to generate transfers of plants and workforce from the old industrial or service centres of the world to their peripheries. The growth of those countries that were once called 'developing' and are now called 'newly industrialized' (NICs) can be essentially read along these lines. The geographic redirection of technologies at higher labour intensity toward cheaper, self-disciplined or hierarchically-organized societies has planted the seed for the development of local industries (or economies) fuelled by the low cost of labour and almost unlimited workforce [Fig. 2]. The transfer of part of the electronic sub-components industry from the US to south-east Asia

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3 Milinda Pathiraja, Artists' Housing in Venice, 1999. First design studio submission at the University of Melbourne after lateral entry in third year from the University of Moratuwa, Sri Lanka. North American and Australian universities are helping to educate the future workforces of competitive regions

4 Comparative increase of workers by region between 1990 and 2010. Within a generation, these regions will have millions of highly skilled, low wage architects and engineers

and northern Mexico is due to this state of affairs, as is, to a very large extent, the growth of software production clusters in southern India and Ireland. The same logic has been shown to affect the whole spectrum of services to production and consumption. Throughout the 1990s, credit companies, banking institutions, insurance and accounting firms underwent a process of collective

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spatial decentralization. This led them to shift their operative sections from areas at high cost of labour and living (Los Angeles, New York, Chicago) to areas only electronically connected to these neuralgic centres of capital: first Phoenix, Las Vegas, Omaha; now Bombay, Bangkok and Hyderabad.

In describing the type of workers affected by such relocation, Robert Reich distinguishes between three work categories: routine production services, in-person services, and symbolic-analytic services (Reich, 1991:177). Routine production services entail repetitive tasks, such as data processing, and are not place-specific. They can thus be moved. In-person services are similarly repetitive but involve person-to-person contact, a characteristic that makes them regional. Symbolic-analytic services include all the problem-solving, problem-identifying, and strategic-brokering activities. 'Such services can be traded

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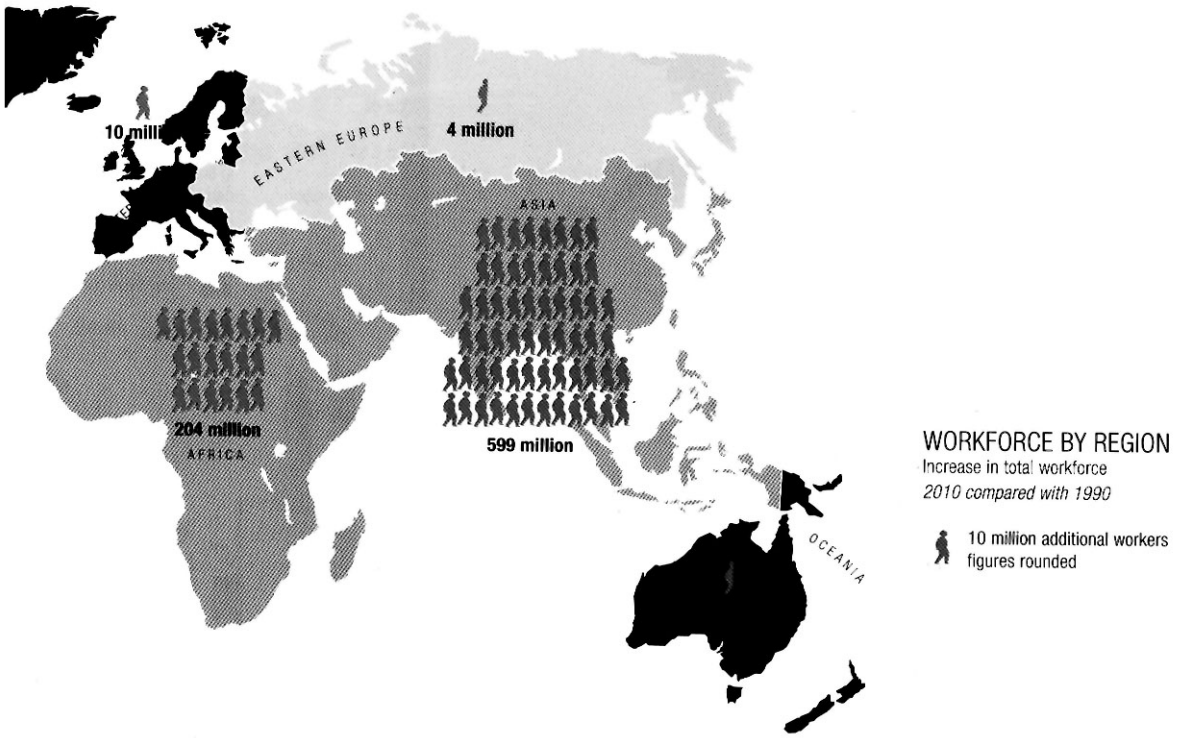

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worldwide ... but they do not enter world commerce as standardized things ... Symbolic analysts solve, identify, and broker problems by manipulating symbols. They simplify reality into abstract images that can be rearranged, jiggled, experimented with, communicated to other specialists, and then, eventually, transformed back into reality. The manipulations are done with analytical tools, sharpened by experience ... Like routine producers, symbolic analysts rarely come into direct contact with the ultimate beneficiaries of their work' (Reich, 1991:178).

Reich's model fits global architectural practice well: in person operators on site and with clients, symbolic analysts in the design studio, and data processors in the draughting room. The problem is to see what percentages of the two last categories can be affected, in reality, by the geographic reorganization of labour.

Reich does not envision barriers to the relocation of data-processing activities, but maintains that symbolic analysts from advanced societies have a comparative advantage over their colleagues from developing regions. This allegedly derives from their superior educational background and job-training opportunities. But North American and Australian universities are helping the future workforce of competitive regions fill this gap right now. At the moment, for example, some of the top students in both design and technology at Melbourne University are from Sri Lanka and Malaysia. In a few years, when the same university will be preparing (as per plan) equal numbers of aspiring architects from Australia and Asian countries, it will be difficult to hold out education (and technical knowledge in general) as the exclusive asset of certain regions [Fig. 3].

As Michael Lind put it: 'Within a generation, the burgeoning Third World population will contain not only billions of unskilled workers, but hundreds of millions of scientists, engineers, architects, and other professionals willing and able to do world-class work for a fraction of the payment their [North] American counterparts expect. The free trade liberals hope that a high-wage, high-skill America need fear nothing from a low-wage, low-skill Third World. They have no answer, however, to the prospect – indeed the probability – of ever-increasing low-wage, high-skill competition from abroad. In these circumstances, neither better worker training nor investment in US infrastructure will suffice ...' (Lind, 1995:203) [Fig. 4].

Bad coins and good coins

Incidentally, the statistical dimensions of the 'relocation' phenomenon in architecture, or for that matter in any other sector, may be irrelevant. In the sixteenth century, Sir Thomas Gresham, the financial advisor of Queen Elizabeth I, pronounced the well-known dictum: 'bad money drives out good money'. As Benedikt explains, Gresham's Law 'refers to the historical observation that when coins containing metal of different value have equal face value, then the "cheapest" ones will be used for

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payment, and the better ones will tend to disappear from circulation' (Benedikt, 1999). What Gresham's Law means for architectural practice is simple: it is enough for one office to make use of 'global' (i.e. cheaper) contributions that the terms of the competition change. Factors reducing design or documentation fees by a certain percentage are normally used by architectural firms in competitive project-bidding.

One should also recognize that the decentralization of the design process is not automatically associated with a decrease in the quality of the service or the product. It is true that an international division of design labour may be associated with firms with a strong commercial emphasis, ready to favour the low cost of project delivery over the quality of design. However, it may well be that resorting to cheaper labour markets allows the firm to apply higher standards in selecting its technical workforce (in entry experience, for example), and to offer conditions of employment that are more stable (and thus professionally more qualified) than those offered within advanced capitalist societies such as the US, where the average rate of annual turnover among architectural firms in the last 15 years has been between 15% and 20% (Dalal, 2000a).

Virtual spaces and real issues

The bottom line of this discussion is that, regardless of its current dimensions, the geographic subdivision of the design process is an important element to consider for future architectural practice because it contains the seed of a fundamental restructuring of professional work. And, given that it seems to hinge on the use of specific technologies – linked to digital information and naturally inclined to lighten the burden of geographic distance – there is no reason to believe that it will not develop alongside the development of such technologies.

For this reason, the architectural debate should start addressing the issue of globalization seriously in its various components. Trying to understand, for example:

- which social and disciplinary objections can be raised at the structure of work outlined
- what questions the geographic division of labour produces in relation to design development, from a technical as well as a linguistic standpoint
- what standards should be upheld, not only graphically but also in terms of labour practices
- what procedures, if any, can or should be adopted to control the work carried out under such conditions
- whether educational institutions should adapt their curriculum to regional collaborations
- and what, in the end, 'technology transfer' means, and what elements it is possible, or advisable, to transfer.

The discussion on these topics lags behind unfolding events. Surrounded by literature which tends to confuse the issues at stake by overstressing the psychological reality of the 'virtual' over the conditions of the 'physical', the work of William Mitchell stands out as perhaps the most complete and balanced treatment of life in a digital society. In *City of Bits* and *E-topia* (Mitchell, 1995, 1999), Mitchell describes the territorial spatialization of e-commerce environments to a surprising level of hypothetical detail. But while acknowledging the relocation of design services as one of e-commerce's by-products, Mitchell glides over its likely dimensions and possible disciplinary consequences. One ought to say that, at this stage, aspects of real practice should be introduced rather than critically analyzed. The point, however, is worth highlighting for another reason. By focusing the discussion on the geography of digital space, Mitchell creates powerful urban and social metaphors, such as 'cities of bits', 'electronic agoras' and 'cyborg citizens', all with a distinct Platonic, and thus utopian (or e-topian), flavour. It could be this slight unworldiness that eventually leads Mitchell to side with the 'many more literate commentators [who] gleefully pointed out the comically close parallels between rabid globalize-or-die rhetoric and that of Marx and Engels in *The Communist Manifesto*' (Mitchell, 1999:110). Herein lies the danger of easy associations.

The screen of modernity

Marx and Engels articulated these processes as early as 1848. It is true, as Marshall Berman shows, that passages from *The Communist Manifesto* provide the definitive vision of the modern world, where 'all that is solid melts into air' and 'all fixed, fast-frozen relations, with their train of ancient and venerable prejudices and opinions are swept away' (Berman, 1988:21). But Marx did not remain in the realm of breathless rhetoric; he did spend the remaining 35 years of his life vivisecting the social details of capitalist transformations in Europe and its colonies, and bringing up some of their innermost contradictions and dilemmas.

So far, we have appropriated the language without showing any comparable interest in the underlying processes. The architectural debate of the late twentieth century seems keen on celebrating the power of modernity by concentrating its attention on design technology and its ability to generate, mobilize or confront ideas. By contrast, the problem of design production has been largely confined to the non-architectural sphere. As a result, the only agoras open to such discussion are those inhabited by, and only accessible to, architectural office managers and productivity analysts.

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In an age of unbridled creativity and boundless

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collaborations, it is helpful to remember what Hanna Arendt once wrote about the thingness of our world: 'Works of art are thought things, but this does not prevent their being things. The thought process by itself no more produces and fabricates tangible things ... than usage by itself produces and fabricates houses and furniture. The reification which occurs in writing something down, painting an image, modeling a figure, or composing a melody is of course related to the thought which preceded it, but what actually makes the thought a reality and fabricates things of thought is the same workmanship which, through the primordial instrument of human hands, builds the other durable things of the human artifice' (H. Arendt, 1958:169).

Perhaps the moment has arrived for us to join Arendt and recognize that, in the end, 'the world of human affairs depends for its reality and continued existence ... on the transformation of the intangible into the tangibility of things' (Arendt, 1958:95). The ability to understand the consequences, to control the terms, and to manage the dynamics of this inevitable process could be one of the challenges – cultural and professional – that await the architecture of the near future.

Notes

1. This investigation is part of two research programmes: Paolo Tombesi: *Geographies of Design: An Analysis of Drawing and Shopdrawing Production*, Melbourne University Publication and Research Support Scheme 2000; and Paolo Tombesi: *Foreseeable Exodus? Australia's Architectural Employment in the Digital Information Age*, Melbourne University Research Development Grant Scheme 2001.
2. This gap could further open when considering differences in the application of labour standards. Five years ago, Czech and Polish engineers with many years of experience were producing complex technical drawings remunerated by piecework for North American clients, at one-tenth the cost of the same information, if produced and paid at official wages and work hours in the US.
3. Trading margin, in this case, is defined as 'the proportion of practice revenue earned after all overheads are paid but before principals' salaries and other remuneration are paid' (Draganich, 1999:11). When these salaries are accounted for, the impact of labour savings on the firm's actual profit is even higher.
4. Rent, however, does not always follow labour advantages. According to the same information source used for Jakarta and Sydney, office rents in Hanoi, Bombay, Ho Chi Minh City and Shanghai were comparable to Sydney, while Beijing and New Delhi were higher.
5. The global telecommunication market was expected to expand from a total of $460 billion in 1993 to as much as $1.1 trillion in 2000, largely due to the limited number of telephone lines available in developing countries. China alone was scheduled to add 35.5 million telephone lines between 1993 and 2000, while Vietnam is planning to install 300,000 lines annually, all using fibre-optic technologies (Parker, 1998:557-9).
6. Even when the difference between internal and offshore wages is higher than the difference in real purchasing power between the two countries involved (captured by the so-called Purchasing Power Parity index – PPP), the level of consumption per capita in the offshore location tends to be much lower, in proportion, than that in the country with higher labour costs. Australia, for example, is almost four times more expensive than Sri Lanka; but the standard of living in Australia requires, on average, an expenditure seven times as high as Sri Lanka's (World Bank, 222-227:2000). Thus, when compared with expected purchasing power, apparently low wages can still contribute to improve workers' local conditions.
7. This could, of course, convince Mexican practitioners against investing time in training their interns.
8. This estimate is only indicative; it includes non-principal qualified architects and non-qualified fee-earners working in firms with more than five employees and with over 80% of their revenues coming from non-residential work.

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