

NEWSOCIETY

2 June 2016 /Special issue/Free

**RESEARCH
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**DUKERIES
THINKBELT**

DUKERIES THINKBELT

When the next round of university building starts, perhaps we should treat education less as a cathedral-town amenity. I print here an architectural project for a 20,000 student 'campus' in West Nottinghamshire which is built around a road and rail network, emphasises temporary housing, and ties in the students to the community

Norman Fellows (after Cedric Price)



Higher education and further education should become a major industrial undertaking, not a service run by gentlemen for the few. The "Dukeries Thinkbelt" outlined here will break down the isolation and peculiarity now associated with universities. It is big enough to involve the whole community and help it to realise that education at this level is not merely desirable but essential.

The Thinkbelt itself will be on a vast scale, and oriented towards science and technology, a kind of cross between Berkeley in California and an ex-CAT. The contrast with the University Centre of Mansfield, which it will include and supplant, could hardly be more extreme. It will rely on temporary buildings rather than permanent ones—to give flexibility and allow experimentation. It will be built around a network of roads and railways which will provide links both internally and with the outside world. The Thinkbelt will be, roughly, a vast triangle, enclosing the whole area around Mansfield and Kirkby-in-Ashfield (see map overleaf). It will be especially closely tied in with the local community as regards housing.

Various reports have appeared in the press indicating that some of the flaws in the current concept of university have a long history. In 1965, for example, the principal of Loughborough Training College, in a letter to *The Times*, made the point about the need to use temporary structures.

"The priorities in education are staff, equipment and buildings—in that order." There was little room for manoeuvre on staff and equipment: they had to be good. But with buildings "the choice is between the solid and permanent or the demountable and temporary. If well designed, sited and landscaped, temporary buildings can look attractive and almost everything can be taught and studied in them." Moreover, "education is in such a state of flux—it always is—and it is so subject to the effects of changing educational, philosophical, sociological and political ideas, as well as to economic crises" that it was only sensible for "the buildings to be adaptable." *Yet now temporary structures are only regarded as a second best until a new university can put up its costly Oxford-style home.*

Then again—on the subject of tying-in universities and the rest of society, Professor Morton of Manchester College of

Science and Technology said the same year that he thought the time had come to appoint professors with part-time commitments in the college, who would keep their industrial posts. *Yet now part-timers who operate the other way round by accepting consultancies are supposed to be rather shamefaced about it.*

And on the question of the meaningfulness of different ways of investing national resources, enormous sums of money can be found for university vanity projects while at the same time about one third of the population of England are living in sub-standard housing. *Yet even now a university's building needs are looked on as something quite separate from the needs of the community that surrounds it.*

The major weakness, however, in present thinking, is that of scale and intensity. Because education beyond 18 is not accepted as a prime national industry, universities and colleges risk seeming to lack (a) recognisable social relevance, (b) the capacity to initiate progress rather than attempt to catch up.

The right priorities

This Thinkbelt study helps to indicate a valid national and regional distribution of educational institutions. The Thinkbelt is planned with local and national communications (road, rail, and air) very much in mind, and it exploits modern electronic communication systems and equipment. It makes great use of mobile and variable physical enclosures (railway carriage lecture rooms, for instance).

The project indicates that education and the need to exchange information may be able to equal defence, energy and commerce needs as generators of urban location and form: cities caused by learning. However, the current analogy between existing universities and ideal town forms is both false and dangerous. Houses—partly for students and partly for local inhabitants—are integral to the project. At the first stage of development, Civic Design is avoided. This is the right order of priorities.

First, then, why this site? This part of West Nottinghamshire—including the "new" Dukeries and Kirkby-in-Ashfield—is less well-to-do than the rest of the East Midlands. As regards building, it is a disaster area, largely

unchanged and uncared for since its industrial decline in the late 20th century. But with a population of over a quarter of a million, concentrated in the conglomerate towns, the surrounding countryside is easily accessible. The area's nearness to both national routes and existing national movement patterns is unexploited. The present industries—hosiery, shoes and metals—though reasonably prosperous, show little sign of important expansion. The coal industry has contracted.

Advanced education, including technical colleges and the WEA, is fragmented. Trent, formerly a polytechnic, was founded as a New University in 1992, and has a student population of approximately 28,000. However, it has little contact with the area and few faculties related to local industries. Many university entrants go from here to other major Midland universities like Birmingham, Manchester or Nottingham.

To begin with, the Thinkbelt will take 20,000 students. This means its effect will be national as well as regional. Its relationship to all other universities is likely to be similar in each case, unaffected by their location. The emphasis on science and industry should produce close links with these faculties in other universities and help diminish their finite, "cut-off" quality. The Thinkbelt will add a major industry, providing a wide range of employment for the present and future population of the Dukeries. The usefulness, one to the other, of the Thinkbelt and the existing community will be twofold. The Thinkbelt will encourage a desperately needed tuning up of the amenities, while local industries will tie in with the related faculties.

The layout of the Thinkbelt—which will encompass the whole area and spread over about 500 square kilometres—allows advanced education to take full advantage of present-day national and individual mobility. And its form and organisation are adaptable for the future.

The Thinkbelt's bias towards pure and applied science and engineering involves a large flexible organisation of faculties with easy links to national route networks. Students must also be able to move very easily between all educational establishments within the Thinkbelt. So there is space deliberately left to spare.

It makes full use of the technological resources (like computers) now reserved largely for activities outside the universities. And the rigid requirements about students' ages and the length of time they must be at university must be replaced by a more elastic system so that part-time and refresher course students can play a full part.

The special and artificial status of student housing programmes, which ignore students' peculiar position within the community living cycle, must go. The Thinkbelt accepts the student as an integral part of the local authority housing programme; and the three-to-five year student cycle is an opportunity for "hot-house" research into new living patterns and types of housing. The requirements of a student population approximate closely to the future pattern of a literate, skilled and highly mobile society.

Types of housing

There will be four main types of housing: **crate, sprawl, battery** and **capsule**. These will put little strain on the local building industry because much of the construction work will be undertaken by other national industries such as light engineering or motor manufacture. In their structure and layout these houses will allow the use of land usually considered unsuitable for housing. Packaged power plant for power generation and water purification not only places no additional strain on the existing services, but also amplifies the network to the benefit of the community as a whole. The new Thinkbelt housing areas produce, in effect, suburban sprawl among the existing towns. When properly planned, such a development lets urban settlements expand without making impossible demands on their physical communications structure—which is likely to be

little more than a leftover from the 18th century or earlier. It also increases the individual's freedom of movement rather than orders it.

Though there are to be 20,000 students, the total capacity of the housing is approximately 40,000 (which does not cover future expansion in the "slack"). Occupancy by Thinkbelt students, teachers and administrators will be phased with people already on the local housing lists and the increased population the Thinkbelt will attract. At every stage a proportion of the housing will be occupied by people not studying, teaching or running the Thinkbelt.

The Thinkbelt has both internal road and rail links—mainly already there. A progressive increase in the number of car-owning students means that the passenger carrying capacity of the rail net will not necessarily fix the Thinkbelt's ultimate size. The rail net will then increasingly shift equipment, but student transport by scheduled railbus services will remain fundamental.

The outer triangle of roads can also take far more traffic than uses them now. Before saturation is reached, the amount of travelling will be levelled off by introducing more sophisticated equipment direct into the houses. The outer triangle reverses the concentration of traffic into congested radial arteries—a situation still implicit in the current local authority road proposals.

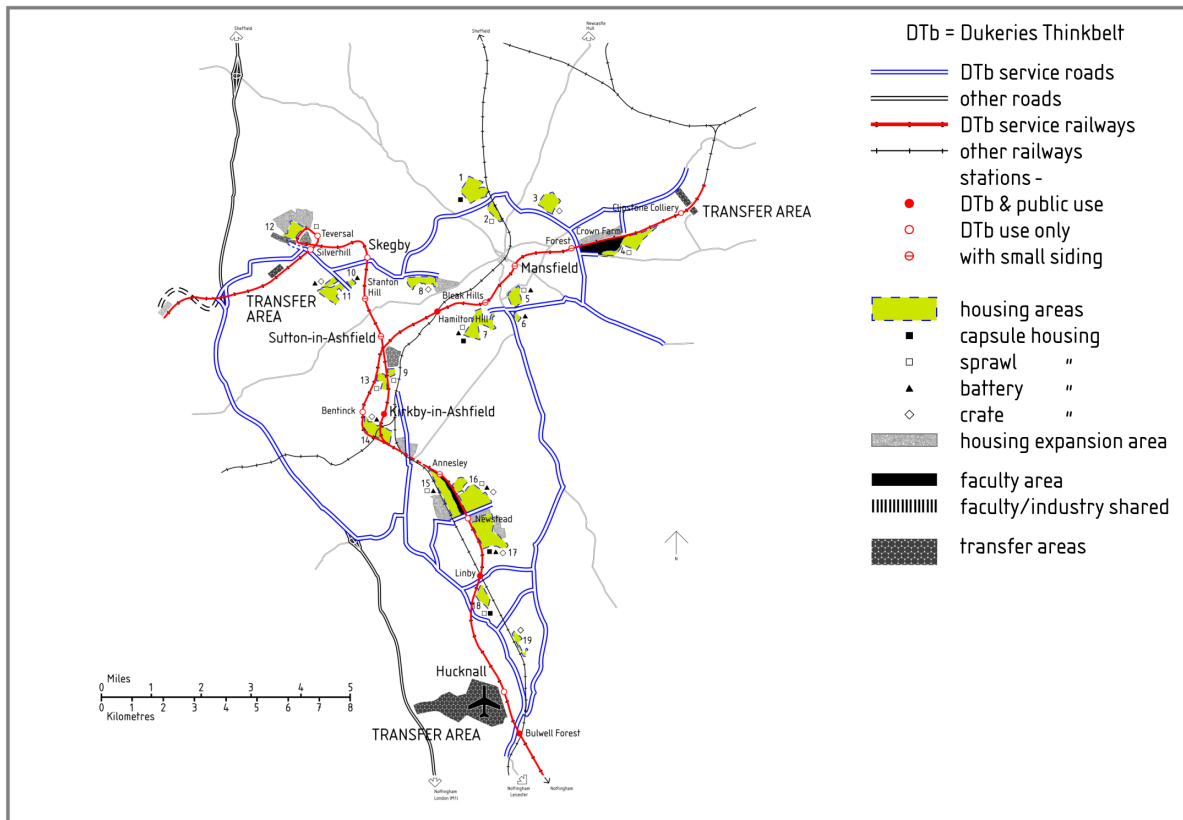
There will be choice between road and rail transport. Electronic, non-physical links will be constructed between student and information store (except where actual physical contact is important). This lets students develop their own patterns of study.

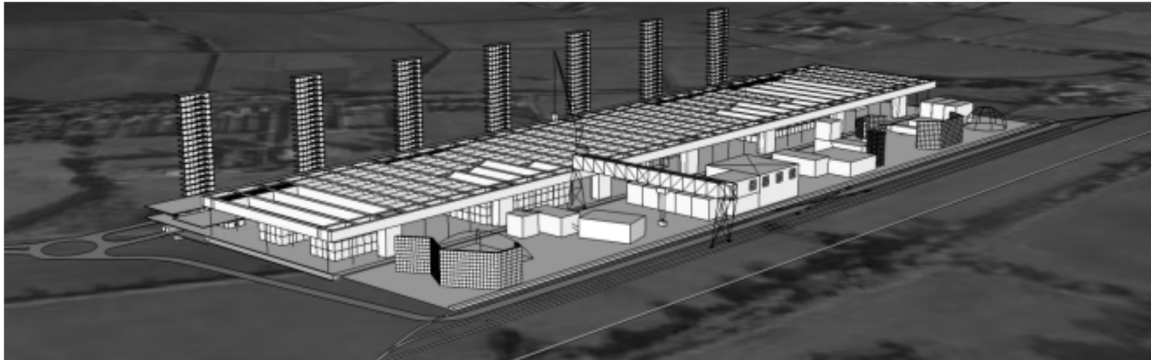
There are national transport links at the three corners of the Thinkbelt triangle (the **transfer areas**): out through Clipstone Colliery to Hull, Newcastle and Sheffield (road

and rail); out through Teversal to Sheffield and the M62, Nottingham and London (M1); and out through Hucknall to Nottingham (road and rail) with national air links via Hucknall airport. Kirkby-in-Ashfield station provides a direct rail link to London via Nottingham. (The Thinkbelt takes advantage of the existing rail network and stations. The Teversal and Clipstone Colliery sections of the Thinkbelt rail net were surplus to British Rail's passenger carrying requirements and were closed to passenger traffic. The conditions which made the Clipstone Colliery section, in particular, uneconomic for normal passenger working—frequent stations at short intervals—make it well suited to Thinkbelt working: railbus with constant density, as opposed to peak working.

Physical links with industry will be used primarily as short-term reinforcement for both sides. Thus the links must be of the temporary kind to be outlined in the account of **faculty areas**. Long-term links with local and national industry will mean that the Thinkbelt will have capacity for the type of experimental construction now confined to the very large industries and state institutions. The ex-cats lack this. The transfer areas will allow rapid movement in bulk of people, goods and hardware in and out of the Thinkbelt network.

The lives of the local people will benefit in various ways. The proliferation of minority activities among 20,000 students will give the community access to specialised equipment for leisure activities. Similarly, the Thinkbelt's information and learning facilities are for general use. The system by which "the public" is self-consciously invited to take part, on surffernce, in certain activities in present-day universities will not obtain in the Thinkbelt. The flexibility of learning equipment and methods will allow



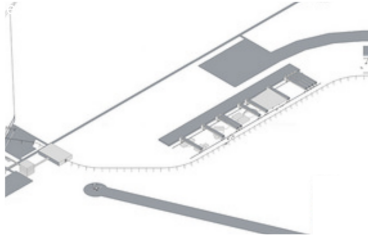


national participation by students in fields at present rigidly defined as "secondary" or "adult education".

The Thinkbelt's effect on employment will be of only short-term benefit to a community until recently heavily dependent on a single industry. But its long-term value will be the ability of its research side to reorientate and revitalise some industries (like textiles) and attract new ones.

The transfer areas are clearly basic to the Thinkbelt.

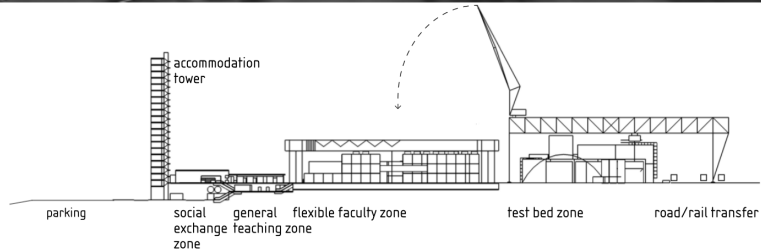
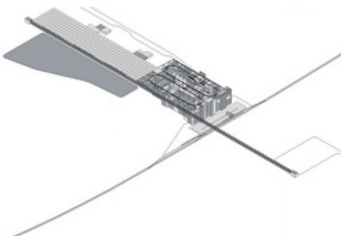
Hucknall has internal road and rail links, and national/international air links. (Internal meaning internal to the Thinkbelt.) It has fixed general accommodation for students and staff, leading directly to the rail-based



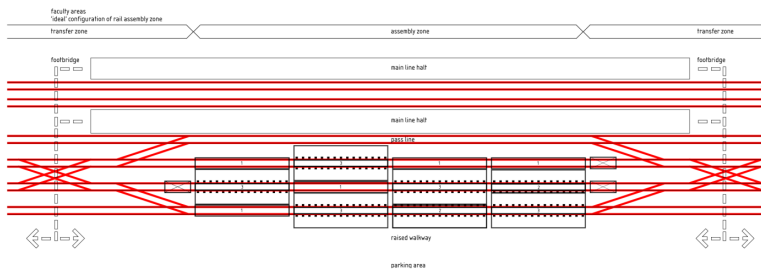
equipment gantries which service short-term portable enclosures. Besides public rooms, the accommodation block provides bedrooms/offices with access to small conference/seminar rooms. The accommodation will be used, in the first place, by short-stay visitors to the Thinkbelt and local industry.

Terversal (top of page) has motorway, and internal rail and road links: and its facilities handle, assemble and construct large-scale goods and equipment. Two workshop zones, which can be varied section by section within the overall structure, lie next to enclosed conventional work areas. These, in turn, adjoin the reception and amenity spaces. Accommodation towers rise from the amenity spaces. These provide minimal "hotel" room for visiting staff who will not be staying very long.

Clipstone Colliery has internal road and rail, and national rail links. This means that there can be quick, continuous transit for



STANDARD SECTION OF RAIL FACULTY AREA
Such sections are designed to enable maximum interchangeability

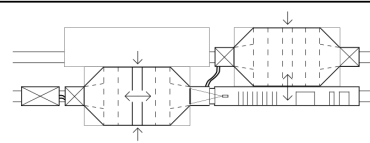


bulk goods and staff. Experimental industrial plant will be installed here on a large scale. Next to this are flexible teaching areas, roofed over by a layer of variable rooms for staff who have round-the-clock responsibility, but who also teach.

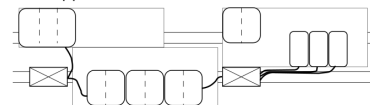
The Thinkbelt faculty areas occur at intervals along the internal rail system. They are based on existing or specially built sidings. They provide rail-based, mobile learning units which fit the immediate needs of each faculty. Equipment is thus used to its full intensity.

There are five main kinds of unit:

1. Seminar units. These may be used either in conjunction with normal railbus services or in separate services (with long stops of scheduled duration at Thinkbelt stations), or stationary in small faculty sidings.
2. Self-teach carrel units. These will be used in conjunction with closed or open circuit TV transmission, or with the linked information and programme store.
3. Information and equipment storage units.
4. Fold-out inflatable units. These will give either two orthodox 30 person lecture spaces or one demonstration/TV area, linked to the storage and equipment stores.

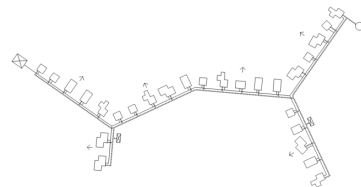


5. Fold-out decking units. These will either be a means of access to other units, or they will support further enclosures.

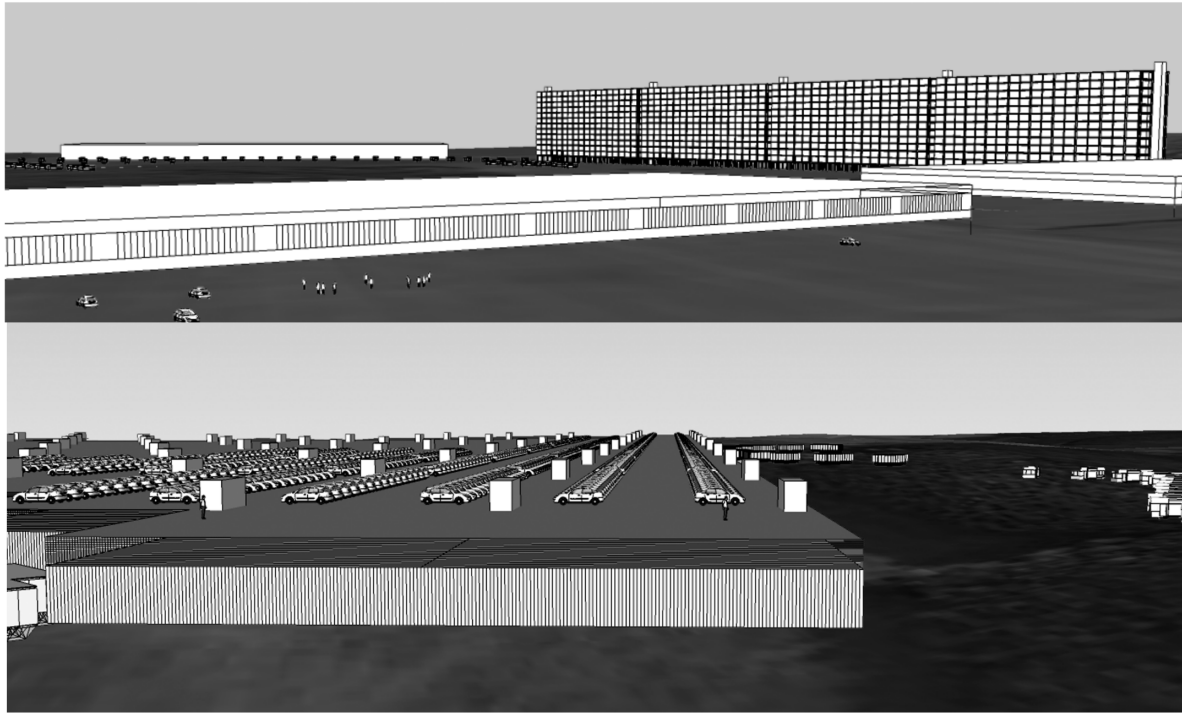


The four types of experimental housing—crate, sprawl, battery and capsule—are all just as feasible today as the different kinds of faculty unit.

Sprawl housing will consist of timber framed prefabricated units arranged differ-



ently to house families of all sizes or age ranges. If people want a larger house for

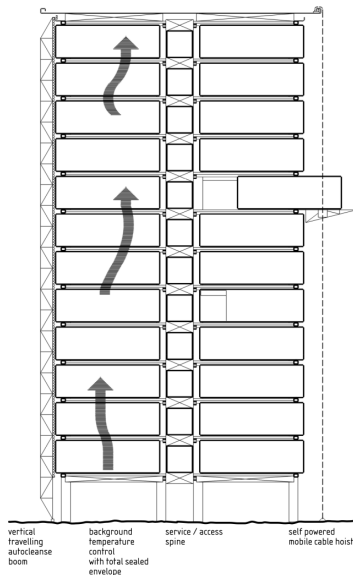


Illustrations show (previous page) Teversal transfer area (at top) view and cross-section, and the standard section of rail faculty area (beneath). This page: (top) the Newstead site, showing battery housing, with crate and capsule in the distance; and (below) the Bleak Hills site with battery, capsule and sprawl housing. The Teversal view and all drawings in this article are by Norman Fellows.

some reason, they will move. The grouping of the houses will depend on the site.

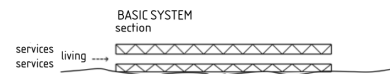
Crate housing will be used on reasonably level sites not liable to subsidence. It will have a 'permanent' 13 storey reinforced concrete frame. Pressed steel living units will be put into position by mobile hoists and sealed to the frame. Air space around the units will give sound and temperature

and ventilated. There will be a services deck (for drainage and so on) above and below the living space, and a promenade on top if the surroundings are attractive. There can also be parking above or below. Like all the other types of housing—except crate-bat-



control. They can be joined in ones, twos and threes to make larger units. Separate parts of the units can be replaced.

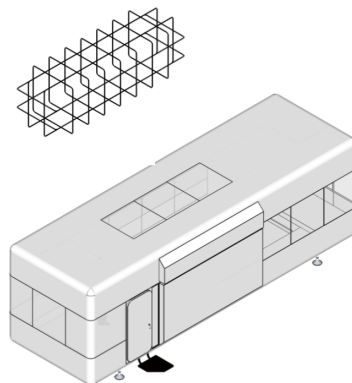
Battery housing provides a sealed environment. The living space will be artificially lit



teries can be jacked up for use on subsidence prone land.

Capsule housing is primarily meant for only one person, or sometimes two. The complete unit will be factory assembled, with all equipment and furniture built in. It will be

ISOMETRIC VIEW showing structural frame and finished capsule



put on jacked supports on almost any site that has a reasonable environment and/or good view. It can be used as a housing

"pool" while other types of housing are being built, or when there is some unforeseen fluctuation in people's living patterns (which is inevitable and happens all the time).

Catalytic effect

It is only after all this has been established that any questions of Civic Design will emerge. The Thinkbelt housing will not just be something external that is unsuccessfully grafted on to the Dukeries. It will be a catalyst, encouraged in its action by the educational side of the Thinkbelt. People will begin to demand an even bigger improvement in their socio-civic environment, and the entrepreneurial instinct will be awakened by the demand.

The housing will perhaps be of quicker benefit to the surrounding community than even the Thinkbelt's educational industry. But, over time, the whole of the Dukeries will be revolutionised. Not only will derelict land be used again, and the old eyesores go: there will also be a major national industry to replace what they will inevitably lose. Other areas could eventually learn from the example of this vast experiment—which would simultaneously save the country money and gain in brains.

It follows from this attempt to unite, rather than separate, student and community, that student grants in the Thinkbelt should become, not loans, but straightforward salaries. If people are doing a job society wants them to do, they must be paid for it.

After the Dukeries Thinkbelt, what would be next? A Eurothink on the French-Belgian coalfield border?

editor's note:

This article is an edited version of material contained in Norman Fellows's *Dukeries Thinkbelt Report*. Diagrams after Cedric Price.