The School of Landscape Architecture
Gloucestershire College of Arts & Technology

Volume 5
Number 1
April 1988

LANDSCAPE ISSUES

Volume 5, Number 1, April 1988

Editorial policy is to include articles, reports, reviews, dissertation and research seminar abstracts concerning a wide range of landscape-related issues. Papers with a bias towards any aspect of rural landscape, landscape education or computer use are of particular interest. Contributions are welcome.

For further details or subscription enquiries please write to:

R.J.Moore (Editor),
Landscape Issues,
School of Landscape Architecture,
Gloucestershire College of Arts & Technology,
Oxstalls Lane,
Gloucester, GL2 9HW Telephone: (0452)426774

Landscape Issues is published twice yearly.

ISSN 0265-9786

STRAIGHT TO THE CORE

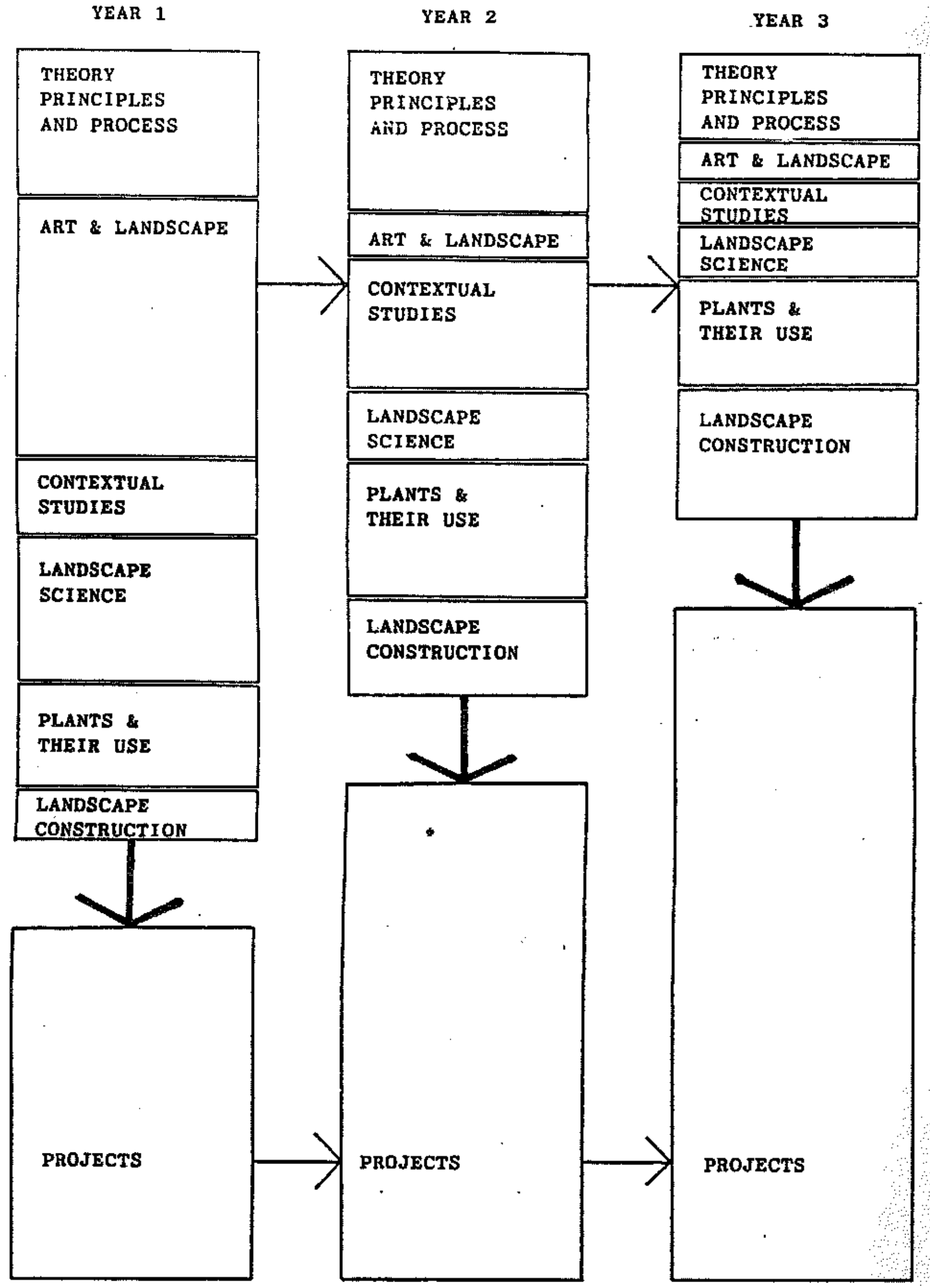
THERE IS MUCH CURRENT debate in educational circles of issues concerning the proposed national curriculum, standardized syllabuses, core subjects and aspects, and peripheral options. The landscape profession, too, is very aware of such developments and is scrutinizing the methods and content of undergraduate and postgraduate courses not only in Britain but also in Europe. Indeed, so important is this matter of identifying the key elements that characterize a distinctive and desirable landscape education that an international conference has been called in Brussels in April this year to disseminate information and opinion and ultimately to make recommendations. Representatives from the landscape professions and educational institutions of each member state of the EC have been invited to attend and contribute to this great debate. Clearly, with the prospect of a common community in 1992 in view, there will be a strong focus on any proposals for modularization or unitization of courses so enabling students of any nationality to accumulate credits and benefit educationally from any of a number of landscape courses that exist in the Community.

By its very nature it is extremely difficult to isolate core components in landscape architecture. Not only is it founded on a joint science and arts perspective of the interaction of man and nature, but also it is the combination of rigorous academic enquiry with precise vocational objectives. What the Landscape Institute Education Group eventually formulated, after discussions over the past year, was a 12-point statement describing what they believed were the required skills of a competent landscape architect. They are as follows:

1. An ability to create landscapes that satisfy human and natural, aesthetic and technical requirements.
2. A knowledge of the history and theories of landscape and the related arts, technologies and human and natural sciences.
3. A knowledge of the fine arts as an influence on the quality of landscape design.
4. A knowledge of ecology as a basis for landscape conservation, planning, design and management.
5. A knowledge of urban and rural design, planning and the skills involved in the planning process.
6. An understanding of the relationship between people and the natural and man-made environment.
7. An understanding of the landscape profession and its role in society.
8. An understanding of the methods of investigation and preparation of a brief for a landscape architect.
9. An understanding of architectural and engineering problems associated with landscapes.
10. A knowledge of physical problems and technologies so as to provide conditions of comfort in the external environment.
11. The necessary skills to meet users' requirements within the constraints imposed by economic factors.
12. A knowledge of the industries, organisations, regulations and procedures involved in translating planning, design and management into landscape.

Such a range clearly reveals the 'generalist' paradigm strongly advocated by many landscape educationalists. Landscape architecture is a synthesizing process and to emphasize the knowledge of certain subjects or skills, whilst tailoring intending practitioners to specific roles, sadly may put at risk their flexibility in a constantly changing market. Furthermore, and perhaps more importantly, landscape architects so trained would lack the broad base upon which a longer-term personal philosophy of landscape architecture could be built.

At Gloucester we believe that the intellectual freedom and development of the student is paramount. The view of landscape architecture presented is not dogmatic but is structured by the recognition of Aesthetics, Ethics and Functions as the categories of values which apply to all spheres of activity. These pervade both the subject



framework of the course and the sequence of design projects which are seen as providing a challenge appropriate to an honours degree. Since the activity of landscape architecture is essentially creative, projects allow the development of an ability to synthesize information and apply critical judgement. This synthesis requires an awareness of context, an understanding of related sciences and technology, skill in handling information and the ability to identify inter-relationships. These abilities are central to the student's intellectual development and represent the common ground of the academic process and the process of landscape architecture, founded as it is on investigation, analysis and synthesis.

The diagram shows the Gloucester course structure simplified but drawn to illustrate the approximate proportions of each element of the three year degree course. The broad subject groupings correspond well with the items in the 12 point list above, and the importance of the design projects is emphasized by the increasing allocation of time to them through the three years.

Returning to the question of modularization of courses, design, in the sense described above, will be extremely difficult, if not impossible, to package separately. Other disciplines will find it easier and indeed many have already made concrete plans regarding discrete programmes of work. What is certain for the schools of landscape architecture in this country is that the wide range of changes in higher education effected by the recent Education Reform Act will bring to the forefront the need to monitor national trends and consequently re-evaluate the role of landscape architecture, both the subject and the profession, for the 1990s. In such light we await with anticipation the recommendations of the forthcoming conference in Brussels.

'EUTROSTOP' LAKE BALATON: a bio-engineering solution to eutrophication

G.W.Hyden

LAKE BALATON IS THE LARGEST inland lake in central and western Europe, being approximately 77 kilometres long and having an area of nearly 600 square kilometres. Occupying a position some 80 kilometres west of Budapest, it has become a popular tourist and holiday area for both Hungarians and foreign visitors. Since the middle of the nineteenth century the water in the lake has been maintained at a level between three and five metres below its earlier levels. This has helped to expose an extremely fertile margin, used at first for intensive agricultural cropping, but now for intensive recreational purposes. Much of the lake edge was initially colonised with reedbeds, but recent development of the lake shore has removed this natural vegetation in favour of hard or beach type edges in order to give easy access to the water. The work of the Hungarian engineers in lowering the level of this enormous body of water has resulted in the average depth over the whole of the lake area being reduced to only three metres. The shallow waters heat up much more quickly than those of most European lakes of similar size, which are of substantially greater depth averaging 100 metres. The water temperature reaches 16°C in May and will rise above 25°C in July giving an average summer temperature of over 20°C.

The main source of water supply to Lake Balaton is provided by the River Zala, entering the lake at its south west corner. The outlet is via the Sio Canal some 60 kilometres to the east along the southern shore. Control of the water level is an important aspect of the engineer's work. Part of this control involved the canalization of the River Zala immediately before its entry into Balaton. It is thought that it was this canalization that was responsible for an appreciable

Gordon Hyden is the Head of the School of Landscape Architecture, GlosCAT, and is particularly interested in bio-engineering applications in landscape architecture.

increase in the sediment being deposited in the western bays of the lake. Even more serious than the sediment itself was the nitrogen and phosphorus contained in the water resulting from the constant over-liberal application of chemical fertiliser on farmland within the catchment area of the river. These dissolved chemicals were enhanced particularly by the nitrates and ammonia released by the decomposing bacteria in the sediments. There was a rapid increase in the growth of blue-green algae and eutrophication at the western end of the lake.

The major changes to the environmental circumstances could therefore be summarised as:

i. Reduction in the natural vegetation at the lake shore, to facilitate access for recreation purposes.

ii. Small water volume proportional to area due to lower water level resulting in high water temperature.

iii. High nitrogen and phosphate levels in the lake water, carried by runoff from agricultural land.

The consequences of these changes resulted in water becoming highly polluted, and having large areas of algal bloom: features particularly unattractive to visitors.

A means to a solution to these problems had, however, been created by the very act of the lowering of the water level of the lake, which appeared to be at the root of the problems. The lake in its form prior to the lowering of the water level had a smaller acolyte, Kis-Balaton (Little Balaton). This lay at the south-western end of the lake and intercepted the inflow from the River Zala. With the reduction in the levels of the main water body, Kis-Balaton had become predominantly a reed marsh. Only small areas totalling half a square kilometre remained of the previous 35 square kilometres of open water. Almost half of this total area had been designated in 1949 as an enclosed nature conservation area. The area was protected from public access and was a particularly important site for its rich variety of birds, over 80 different species being identified as nesting in the reeds.

The site was a perfect base for research and scientists from the University of Agricultural Sciences at Keszthely had been carrying out studies on aquatic macrophyte associations since 1974. As a result of this research it

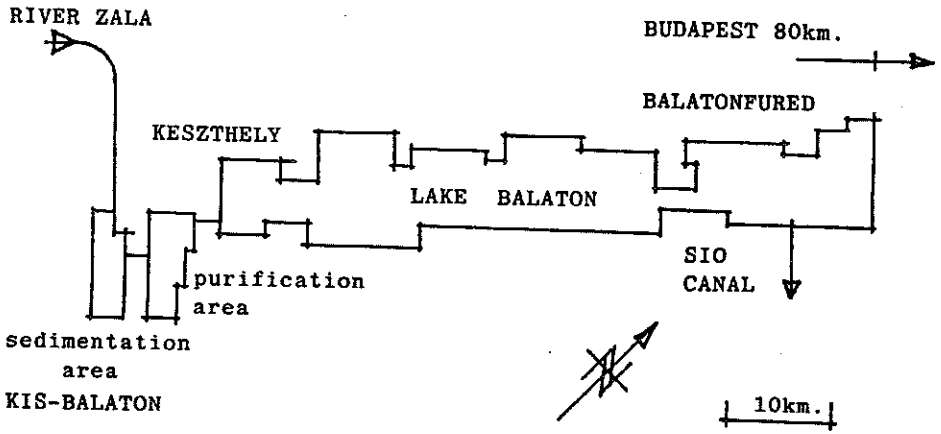
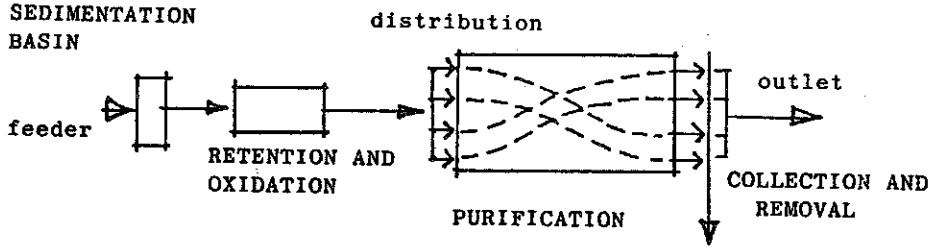


DIAGRAM OF THE BALATON SYSTEM



SCHEMATIC DIAGRAM OF THE SYSTEM

was possible to identify certain plants as having an ability to capture and take up soluble plant nutrients. Particular interest was taken in the rate of absorption and subsequent release of nitrogen and phosphate. Some species absorbed these elements at a particularly high rate during certain phases of their life cycle. If plants were however allowed to complete the cycle, by dying and subsequently decomposing into the lake silt, the chemicals would eventually find their way back into the system. Harvesting of the plants during the period when they had taken up the maximum amount of undesirable elements would interrupt the normal cycle and the chemicals could be removed from the system.

Instead of trying to reverse this deteriorating situation by the use of more chemicals or hard engineering solutions the Hungarians came up with the idea of using a method based on natural systems and bio-engineering techniques.

Using Kis-Balaton as an interceptor they set out to design a system which could remove suspended solids by sedimentation, improve the oxygen content of the water, distribute the flow efficiently through a purification process and remove the offending material before allowing the water to enter the main water body.

From the measurements taken between 1975 and 1985 the materials getting into Lake Balaton from the River Zala amounted to:

Phosphorus	80 - 120 tonnes per annum
Nitrogen	1,000 - 1,500 tonnes per annum
Suspended solids	5,000 - 10,000 tonnes per annum

There were three distinct operational decisions to be made:

i. The selection of plant species which would be most effective in the process of removing the undesirable chemicals.

ii. A water engineering design which would control the flow through the system to ensure that the water would have the oppportunity to give up the elements.

iii. A satisfactory cropping management technique which would be able to remove the vegetation efficiently from the area at the correct time.

Choice of species

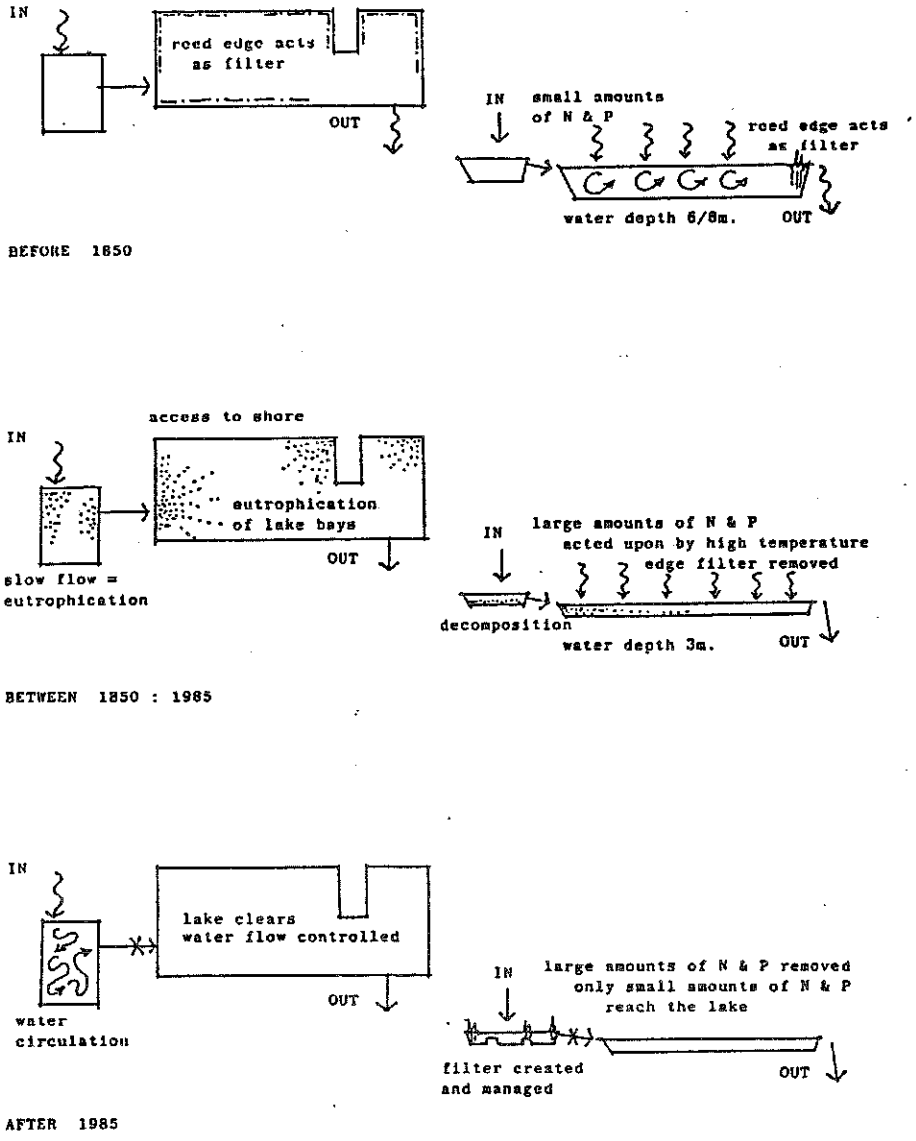
The choice of species was first made on the basis of the research carried out by the scientists. Subsequent monitoring of the system in action has modified the choice. To some extend the system will be self-regulating, with those plants which thrive best taking over from others which are less well adapted to the conditions. Close and careful checks are kept on the numbers, location and performance of the various species. But it seems that once the system has reached a stable state, there will need to be only minimum intervention with this component of the scheme. The development of the plant communities in Kis-Balaton have so far been dominated by the following species:

Prior to construction: Juncetum maritimi
During construction: Scirpo-phragmitetum typhetosum
Post-construction:
i. Carex spp dominant
ii. Carex spp repressed in favour of Phragmites and Typha spp.
iii. Phragmites repressed in favour of
Typha angustifolia in deeper areas,
Typha latifolia in shallow areas,
Lemna trisulca over water surface,
Utricularia vulgaris over water surface, and
Myriophylum in edge areas.

It is expected that stabilisation of the plant communities will take between five and ten years from implementation.

Water engineering design

The engineering control system needs to be very sensitive and responsive to day to day changes. The amount of water held back in Kis-Balaton is not only decided by the need to obtain the most effective bio-engineering requirements but is also subject to the water demands down stream, beyond the lake itself. The three phases of the system need quite different methods to allow the necessary changes to take place. Sedimentation can only occur if the water flow is slow enough for the suspended solids to sink and settle in such a way as not to be disturbed by any increased flow into the system. The



DIAGRAMATIC DEVELOPMENT OF THE BALATON SYSTEM

oxidation process needs the rapid movement and disturbance of the water for a reasonably long period of time. Finally in the purification area (removal of nitrates and phosphates) the water must not be allowed to flow too quickly through the planted areas. This, by far the largest part of the system, is laid out as a series of interlinking channels, through which the water is guided. Locks are used to control the lengths of water stay which is determined according to the extent of pollution of the inflow water.

Cropping management

The cropping of the plants must be carried out properly and at the right time if the maximum amounts of pollutants are to be removed. The earlier research concluded that the highest retention was found in the species with submerged roots and that the above ground organs had a higher release factor than the underground parts. However, any part of the plant which is not removed before decomposition takes place will allow the elements to return into their immediate environment. The speed and accuracy required on an undertaking of such size presented the engineers with a problem they chose not to deal with themselves. The answer lay in Holland where for many decades the Dutch had been dealing with such large scale harvesting of reeds as part of their polder land reclamation projects. It was one of these Dutch-made floating harvesters which emerged as ideal for use in the Kis-Balaton process. The purchase and eventual use of such a machine provided the final component in the project. Having harvested the reeds and other plants it is of course important that their contents are not allowed to find their way back into the cycle. Much of the material is burnt in furnaces for heating systems, perhaps some for heating greenhouses. It might also be interesting to speculate on the use of such harvested material so rich in nitrogen and phosphate being used instead of the new chemical fertilisers on the agricultural land from which the nutrients have leaked.

Construction on the Kis-Balaton 'protecting system' was started in 1981 and was completed four years later in 1985. As a 'bio-engineering' project it is interesting that some 3500 cubic metres of concrete and 290 tonnes of iron and steel were used. However 850,000 cubic metres of earth work was needed to complete the 21 kilometres of dams; there were 250,000 cubic metres of other earth work and the construction of 32 kilometres of ditches and canals was required. In spite of the system relying so

heavily on natural systems, it is necessary to have two pumping stations to keep the water movement and levels under control.

The Kis-Balaton scheme is on a massive scale, needing national investment and wide political powers to bring it to fruition. It can, nonetheless, be seen as a pioneer in the use of bio-engineering techniques to resolve problems created by the ignorance of people in overloading the ecological systems for the benefit of short term gain. Perhaps with further painstaking research, of the kind carried out for many years by the scientists at Keszthely and the imaginative use of their results, we may be able to plan and manage smaller scale systems which will have the same dramatic effects on other deteriorating situations.

Bibliography

Czinki L (1985) Pilotprojekt zur Sanierung von Gewässen, Garten und Landschaft, Munich.

de Bruin D et al(1987) Ooievaar: the future of the river area, Stichting Gelderse Milieufederatie, Arnhem.

Karpati I et al(1983) Aquatic macrophytes, International Symposium, Nijmegen.

Karpati K & Pomogi P (1979) Accumulation and release of by aquatic macrophytes, Akademiai Kiado, Budapest.

Sabestyen T (1982) Lake Balaton: a comprehensive guide, Corvina, Hungary.

Szilagyi F et al(1987) Biology in Water Management, International Conference, Budapest.

Viziterv (1981) Kis-Balaton Protecting System, West-Transdanubian District Water Authority, Hungary.

THE LANDSCAPE ARCHITECTURAL USE OF SATELLITE IMAGES

R.J.Moore

IN EARLY 1988 the School of Landscape Architecture, GlosCAT, purchased a computer-compatible tape containing satellite image data covering much of Gloucestershire. There then followed a period of research and development of computer programs to display and analyse the data. Work is now sufficiently advanced to justify an interim statement describing the system that has been produced and a discussion of its application to landscape architecture.

The following report introduces the subject of remote sensing the earth from satellites, describes the characteristics of the electro-magnetic spectrum and attempts to explain the significance of the spectral reflectance of earth cover types, particularly vegetation. The principal image processing computer programs are then outlined and their value in landscape architecture is assessed.

Remote sensing

According to Mather(1986) remote sensing is the use of radiant energy-sensing instruments mounted on aeroplanes and satellites "to measure...the spectral features of the earth's surface" from which the physical characteristics of the land — soil types, vegetation, urban and rural land-use — can be inferred. Aerial photographs are remotely sensed and have long been used for both mapping and feature interpretation. Specialized cameras are needed and are usually employed in conventional aircraft and helicopters, although occasionally standard 35mm film has been shown to produce acceptably clear pictures from

Robert Moore is science subject leader in the School of Landscape Architecture, GlosCAT, and is researching a range of computer applications for landscape architecture.

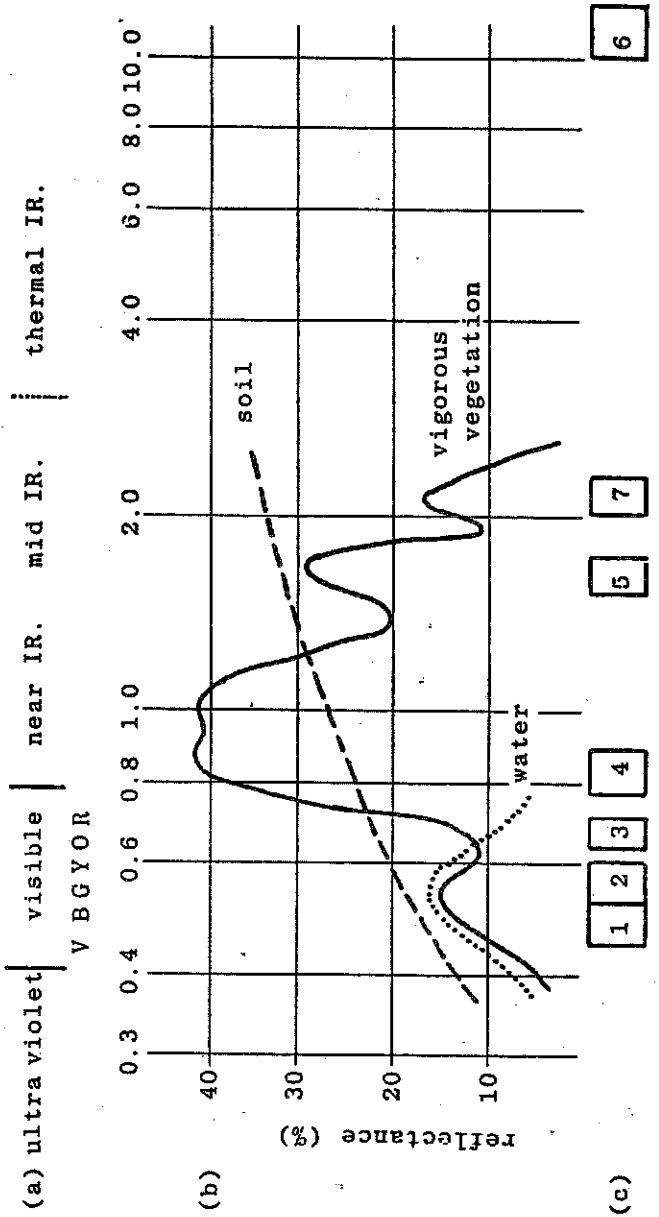


Figure 1 (a) The electromagnetic spectrum (logarithmic scale, units = μm).
(b) Spectral reflectance curves of soil, water and vegetation. In the case of vigorous vegetation there are peaks in the visible green, near infrared and mid infrared corresponding with leaf pigments, cell structure and water content as dominant factors controlling reflectance.
(c) The Landsat Thematic Bands.

less conventional aircraft (Moore,1984). Satellite images, on the other hand, are relatively recent phenomena and are derived from the scanning of a wide path across the earth, as the satellite travels along its orbit. The result is not an analogue photographic print but a digital data set which is a record of the average radiance levels of discrete cells of ground, say 30m square, sensed by the instruments on board the satellite. These number values, usually in the range of 0-255, can be reassembled as shades of grey where 0=black and 255=white to generate visual images of land or sea surface scenes. To all intents and purposes they resemble vertical photographs, but on closer inspection the 'grain' is a mosaic of square picture elements, known as 'pixels'. If the images are polychromatic the colours are unrealistic because their mixing is based for the most part on bands of the electromagnetic spectrum which are outside the visible portion. This colour mixing, the screen display and any further enhancements and manipulations of the images are most efficiently achieved through the use of computers, activities best described by the term 'satellite image processing'.

The electromagnetic spectrum

The scanning instruments on board the satellites sweep successive strips of the ground about 185km wide, and comprising many thousands of pixels. The pixel count depends on the resolution of the scanners: on the early Landsat satellites they represented 80m cells of the surface, the later Landsats 40m and the recent Spot satellites 10m. For each pixel radiation reflected or emitted from the land or sea surface is recorded. Most satellites have multi-spectral scanners that enable reflectance from several parts of the electromagnetic spectrum to be sensed simultaneously (Fig. 1), not just the portion (0.4 -0.7μm) visible to the human eye. The advantage of using other spectral bands is that they can reveal more information about the nature and pattern of certain surface features. For example, near infra-red(IR) radiation has been found to be particularly useful in discriminating vegetation species and highlighting crop disease, and far infra-red is valuable in geological mapping. It is important to remember, however, that soil, rocks and vegetation are not detected directly, "rather their nature is inferred from the properties of the radiance levels"(Mather,1986). As can be seen in fig. 1, the majority of the Landsat 'Thematic Mapper' bands are towards the red end of the spectrum. This is because the atmosphere tends to scatter radiation

from the shorter-wave violet end, rendering it of limited use in imaging systems.

Satellite platforms

Whilst the TIROS-1 weather satellite launched in 1960 transmitted the first black and white pictures from space and pioneered the development and wide use of meteorological satellites, remote sensing probably owes more to the US space programme of the late 60s and early 70s both in terms of technical progress in hardware but also through the 'open skies' policy whereby scientists from all over the world had access to the image data.

The NASA Landsat series is probably the best known mission. The first three satellites, launched in the late 70s, circled the earth in a polar orbit at a height of 915km with a repeat cycle of 18 days for the same ground path. The main sensor on board was the multi-spectral scanner (MSS) with a resolution of 80m. In theory this means that features on the ground are

		wavelength(mm)	resolution	image format
Multi-spectral scanner (MSS)				
Band	1	0.50-0.60 (green)	80m	185km
	2	0.60-0.70 (red)	80m	
	3	0.70-0.80 (red-near IR)	80m	
	4	0.80-1.10 (near IR)	80m	
Thematic Mapper (TM)				
	1	0.45-0.52	30m	185km
	2	0.52-0.60	30m	
	3	0.63-0.69	30m	
	4	0.76-0.90	30m	
	5	1.55-1.75	30m	
	6	10.40-12.50	120m	
	7	2.08-2.35	30m	
Spot				
	1	0.50-0.59	20m	60km
	2	0.61-0.68	20m	
	3	0.79-0.89	20m	
		0.51-0.73	10m	

Figure 2 Wave bands recorded by MSS, TM and Spot sensors.

visible if they are larger than 80m, but in practice the degree of tonal contrast and the form of the feature (eg linear) significantly affects interpretation.

The second generation of Landsat satellites, initiated in 1982 and orbiting at a height of 705km, carried not only the MSS four-band scanner but also the Thematic Mapper (TM) which recorded data in seven wave-bands with a resolution of 30m in the visible, near and middle infra-red and 120m in the thermal infra-red (fig. 2)

The French satellite SPOT-1 (Système probatoire d'observation de la terre), launched in 1986, has brought increased spatial resolution capabilities. Its panchromatic mode offers a 10m pixel representation permitting far greater discrimination of small features on the surface.

The ERS-1 mission planned for the early 1990s will use microwave sensors to survey, firstly, oceans and sea ice and, later, the land surface. The advantage of such sensors is that they are rarely affected by cloud cover and other meteorological situations.

Spectral reflectance of vegetation and other cover types

Each earth surface material has its own spectral reflectance 'signature' — a curve which varies uniquely to wave-length and percentage reflectance (fig. 1). By identifying the characteristic response for different wave-bands (as sensed by the satellite scanners), each material can theoretically be discriminated. In practice there are some limitations to achieving perfect interpretation but work continues to reduce the degree of error in this 'labelling' of features. This will be discussed later under 'classification'.

The spectral reflectance curve representing vigorous vegetation (fig. 1) is especially interesting and its form requires some explanation. In the visible portion of the spectrum there is a peak in the green band, as one would expect, since vegetation is in the main perceived as green. The low visible red and blue is due to the absorption of these bands by the plant's chlorophyll to provide energy for photosynthesis. In the near infra-red portion of the spectrum there is a dramatic rise in reflectivity, and between 0.75 and 1.35μm the high plateau of reflectance is due to internal leaf structures in the vegetation. The curve then begins to fall away in to the mid infra-red with troughs coinciding with the effects of leaf-tissue water absorption of energy.

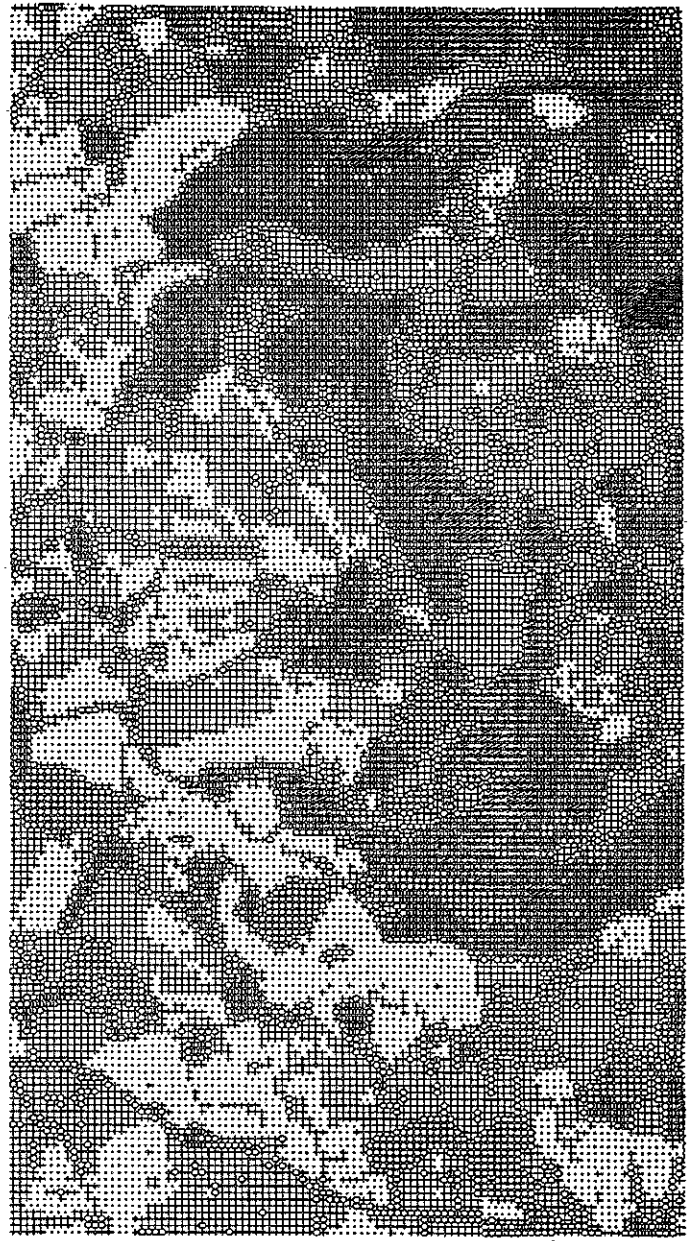


Figure 3 Part of the Gloucestershire satellite scene, printed as a choropleth map on a line-printer.

With a young to mature, healthy plant the near infra-red peak is at its maximum, but as the plant ages or suffers from disease or drought there is a marked decline in reflection level, even though the visible green colour of the plant is initially unaffected. Clearly the spectral signature can be used to diagnose plant status. Likewise, whilst the broad shape of the curve is typical of all green vegetation, minor variations indicate differences in plant species. However it must be stressed that no 'ideal' spectral curve exists for every species owing to seasonal differences in solar illumination, atmospheric effects and phenological state of the vegetation. Discrimination of broad-leaved and coniferous woodland can be further aided by using multi-temporal imagery, that is comparing, say, winter and summer canopies and so identifying the deciduous elements.

Now a brief look at the application of satellite images in rock, water and soil studies. Anomalies in the reflectance curve of vegetation have been used to make inferences about soil chemistry and organic content and the location of minerals. With water there is virtually no infra-red reflectance, and such a characteristic is valuable in the precise mapping of water bodies and tidal limits. Suspended material in the water, such as mud and sewage, can, however, be detected.

GLIMPSE: GlosCAT's image processing system

Initial work in GlosCAT on developing computer processing of satellite image data was based on the College's Prime mini computer, but image output was only possible in the form of line-printer maps (fig. 3). Now, however, the data is held on Apricot floppy disks and processed on a Pluto 8-bit system, which can display 256 grey shades or different colours simultaneously on a high resolution screen.

A number of computer software techniques have been developed which are capable of improving the appearance of satellite pictures and these are known as image enhancements. As with photographs, satellite images may be poor in contrast. If one considers the nature of the digital image, reflectance levels may be confined to a limited range within the sensor's total potential, eg 10-187 when the optimum number of grey tones is 256. The computer can be employed to 'stretch' the narrow range in order to brighten an under-exposed image (fig. 4), and so make it more easily interpreted.

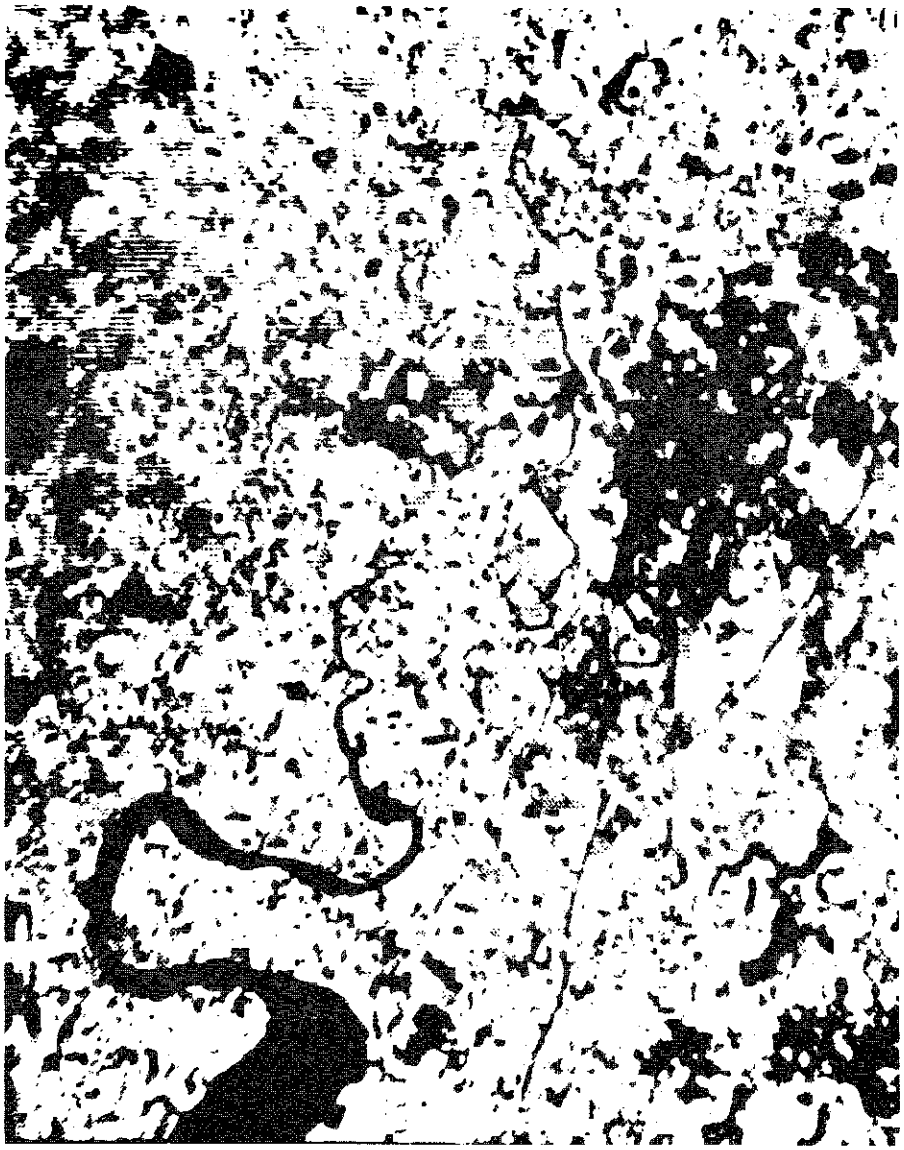


Figure 4 'Stretched' satellite image to improve picture contrast.

Figure 5 Satellite image 'sliced' into 8 grey shades. (Original in pseudo colour)

The human eye can differentiate more colour hues than shades of grey, so the display of the image can be improved by colour-enhancement. Strictly speaking this technique is known as pseudo (not false) colour enhancement and a common method is to allocate colours to contiguous ranges (or 'slices') of grey shades (fig. 5). False colour images are generated by assigning the three primary colours to each of any three sensed wave-bands. Colour on images could only be natural if the three visible primary colour bands in the spectrum were sensed and each band values subsequently applied to the appropriate colour guns in the monitor.

The readability of satellite images is sometimes hindered by the presence of noise: extreme pixel values which may be in error or reflect local conditions. At other times specific detail, for example boundaries, is lost or obscured in areas of apparently monotonous pixel shades. Filtering techniques enable the user both to suppress stray pixels resulting in a 'smoothed' image and to highlight edges and local texture to produce a 'sharpened' image. The smoothed image (fig. 6) is particularly useful in discerning general patterns over the area of interest, whereas the sharpened image can help to emphasise field boundaries, linear features, changes in land-use and to provide a measure of landscape texture. Figure 7 shows clearly the small unit sizes of the farmed landscape in the Vale of Gloucester contrasting with the larger scale cereal farmscapes of the Cotswold dip slope to the East.

Ultimately the principal use to be made of satellite images by those in the landscape professions is to attempt some sort of classification of land-use either generally across the image scene or concentrating on, say, a vegetation survey of a small area. What this means is that the computer, once informed of the spectral criteria by which to discriminate different cover types, can automatically 'label' the pixels (by specific colouring) so producing a digital thematic map.

The technique is based on plotting the positions of each ground cell (represented by the screen pixel) as wave-band coordinates in a Cartesian system. Simply, as we have seen, vigorous vegetation reflects low in the visible red band but high in the infra-red, and such a situation can be shown as a cluster of points on a two-axis graph (fig. 9). For the same bands, water responds weakly in both cases — visibly it is blue/green rather than red and the infra-red response is virtually

Figure 6 'Smoothed' satellite image, useful in pattern recognition.

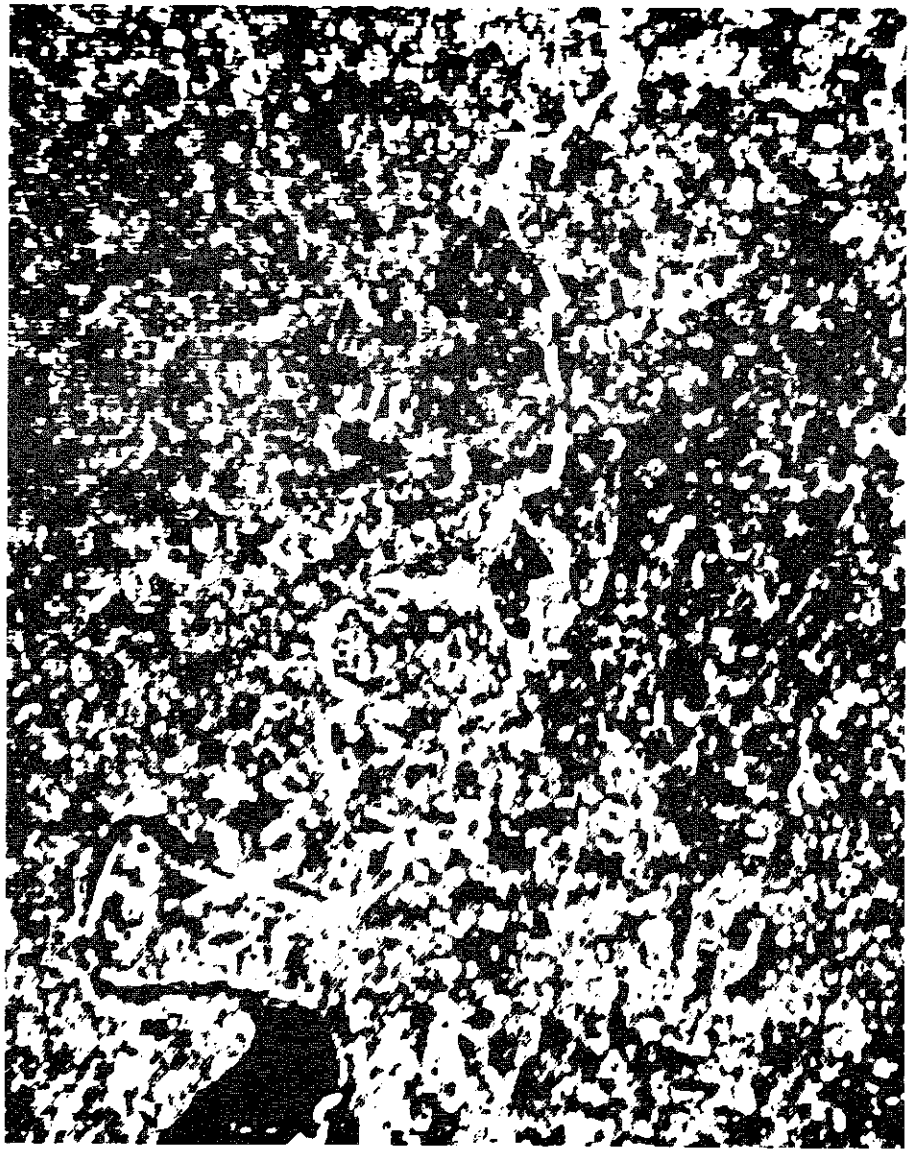


Figure 7 'Sharpened' satellite image to highlight landscape 'texture'.

Figure 8 'Classified' area on the Gloucestershire scene.

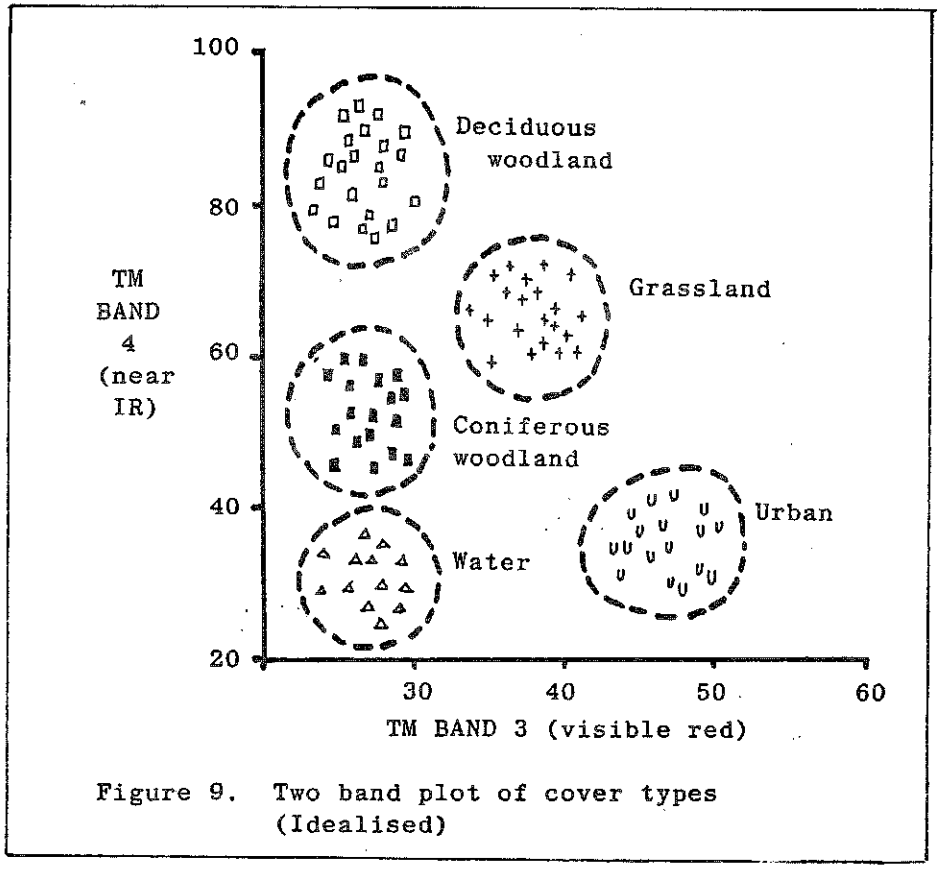


Figure 9. Two band plot of cover types (Idealised)

non-existent. Likewise other surface materials positions can be derived, and rather than limiting the computation to a two-axis model, three, four or however many bands that data is available for can be employed to ensure more accurate classification. The computer merely has to read the values for each ground cell in each of the wave-band data sets and then match this 'pattern' to already determined land-use 'templates'. In other words each pixel is allocated to its nearest 'cluster' in geometrical space. Fig. 10 is an attempt at classifying a small area to the south west of Gloucester. Reproduction in this periodical unfortunately does not do justice to the quality of the original image.

Further developments and applications

At the time of writing (February, 1989), a 24-bit framestore has been ordered for the College's Prime computer. This will not only offer better colour display but will permit speedier processing and easier access to larger data files. The standard screen image contains 512 x 512 or 262,144 pixels and when combining three spectral bands necessary computation involves over three-quarters of a million individual values. Clearly a fast computer is a prerequisite in such work.

As regards landscape architectural applications of satellite image processing there is much potential. Mention has already been made of the value of initial vegetation survey of a reconnaissance nature. There is also much topical interest in the erosion of green belts by housing developments and damage to the environment by mining and similar operations. Traditional land-use surveys (eg. the 1:25000 survey of Alice Coleman) are quickly out-of-date and/or difficult and expensive to produce. Satellite images can offer a multi-temporal view of landscapes, allowing change to be monitored more readily.

Despite the progressive improvement in resolution of the satellite scanners, however, it is doubtful if they can ever fully replace conventional survey (and some would argue this would not be desirable), and constant field validation should be strongly advocated. At a more general scale of pattern recognition, landscape evaluation and regional mapping it is now unsurpassed, and it is satisfying to note some recent projects focusing specifically on issues relevant to the work of landscape architects (Smart,1986). One would hope these are just the beginning of an upward trend of applying this technology to refining environmental understanding and informing landscape decisions.

The writer would like to acknowledge the financial support for the project from the Colleges's research committee and technical advice from the Computer Unit.

References

Harper D (1985) Eye in the sky: introduction to remote sensing, Multiscience Pub.

Mather P M (1987) Computer processing of remotely-sensed images, Wiley

Moore R J (1984) Remote sensing by radio control, Landscape Issues, vol 1(March).

National Remote Sensing Centre Various information sheets: A01, A03, A04, A08, FS06, LZ5, SS04, SS05, SS11 and SS12.

Smart C (1986) Landscapes of Wales: remote sensing, Landscape Design, 159(1986)Feb.

Thomas I L (1987) Classification of remotely-sensed images, Hilger.

THE IMPACT OF GOVERNMENT SCHEMES ON ENVIRONMENTAL WORK IN THE COUNTRYSIDE

Nigel Curry and Peter Gaskell

Introduction

GOVERNMENT WORK SCHEMES of one sort or another have had a significant influence on environmental work, particularly in the countryside, over the past few years. Drawing on research recently undertaken for the Countryside Commission, this paper reports on some of the advantages of such schemes and on a number of the problems that have been encountered in their implementation. It also reports on the introduction of a new type of training scheme by the Government, announced in February 1988, and recounts speculations about the impact of this new scheme, voiced by a number of agencies. The legitimacy of such schemes in enhancing the rural environment is then assessed.

Government Schemes and Environmental Work

At October 1987, there were over 800,000 people employed on one type of Government training scheme or another. The detail of this work is set out in table 1 below. Of these, it is the Community Programme Scheme that is most concerned with countryside projects. Although no data is available about what proportion of this quarter of a million people work in the countryside, it is likely that a large amount of countryside environmental work does take place within such programmes. Evidence in support

Dr Nigel Curry is Director of the Countryside and Community Research Unit at GlosCAT and Reader in Environmental Studies. He has published widely in the fields of countryside recreation and rural readjustment. Peter Gaskell is a researcher in the same Unit. His main interests are in rural employment and agricultural landscape management.

of this comes from a recent research project, that is examining the kinds of impacts that Countryside Commission grant-aid programmes have on the maintenance of rural employment.

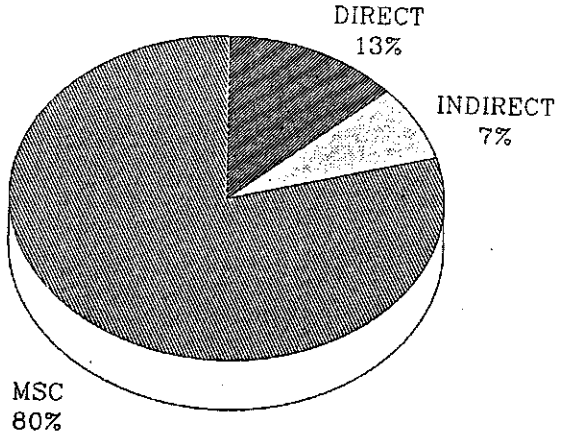
Table 1 Numbers of people employed on Government Training Schemes, 1987

YTS Trainees in Training	431,209
Community Industry Scheme	8,000
Community Programme	224,000
Enterprise Allowance Scheme	97,000
Job Release Scheme	20,000
Jobshare and Jobstart Allowance	5,848
New Workers Scheme	19,000

Source: Department of Employment Gazette (1987)

One characteristic of the analysis of jobs associated with Commission grant-aid is the extent to which they are also dependent on funds from the Manpower Services Commission (MSC). In the research, grant-aid recipients were asked to distinguish between the employment created directly in association with a Countryside Commission grant, that created indirectly, and that created only in association with MSC funds. The results of this enquiry are contained in figure 1.

Figure 1 Direct, indirect and MSC related jobs associated with Commission Grant-Aid



This degree of dependency on the Manpower Services Commission in the development of environmental jobs in the countryside (nearly 85% of all jobs in the survey had some form of MSC support) is clearly considerable. Although this assertion relates only to a small sample of jobs, it is indicative of a more general dependency that has been expressed by a wide range of agencies concerned with environmental employment, interviewed in connection with the Commission research.

The Impact of Government Schemes: Some Empirical Evidence

Some idea of the impact of these types of scheme on the rural environment comes from both these Countryside Commission interviews and other sources. The Association of Countryside Rangers (1987), for example, recently has conducted a national survey of Government training schemes and environmental work with some 111 questionnaire returns. They found that of all people employed through such schemes to undertake environmental work, some 88% were through the Community Programme, and 6% each through the Youth Training Scheme and the Community Industry Scheme. Seventy eight per cent of all of these workers were employed in the field, rather than in administrative posts.

From this survey and the Commission research, a number of characteristics of Government training schemes and environmental work have emerged. Firstly there are often problems of duplication of effort, and lack of co-ordination between schemes. Sometimes workforces are simply too large for the job in hand, but this is often more of a function of the agencies' desire to get people on schemes than any notion of the labour requirement for particular jobs. Adjacent schemes often, too, do not know what each is doing and this can sometimes have counterproductive results. To quote from the Association of Countryside Rangers (1987, page 1):

"Unco-ordinated schemes included ridiculous duplication on footpath projects, the clear felling of a tree planting scheme, contradictory health and safety instructions and the replanting of a cleared viewpoint".

In one case in the Commission research, such potential problems have led to an employer abandoning an MSC programme since he has found that it is damaging his relationship with the local landowning interests with whom he has to work.

A second aspect of environmental work schemes is that of the supervision of training. Many organisations feel that the time taken up by permanent staff in supervising and directing MSC employees is sometimes not cost-effective. This is in part due to the frequency with which new people are joining schemes, and others leaving. A number of organisations in the Commission research are addressing such problems by employing staff specifically to organise and streamline their MSC operations. Whilst adding to staff numbers, such a strategy releases other employees to concentrate more fully on their 'proper' duties.

Supervision (and indeed the training of staff) is also made more difficult by the fact that some staff are at work when others are not. The Countryside Commission research indicates that of all MSC funded jobs associated with Commission grant-aid, nearly 60% of them are part-time It is felt by some, that the work achieved at the end of the day with Government training scheme employees could be done more quickly by a smaller number of permanent full-time staff.

In a number of geographical areas, particularly of high employment, difficulty is often experienced in recruiting suitable staff to schemes. This is critical in the context of supervisory posts. In some instances, scheme agencies are having to find supplementary salaries to keep key people in post to allow continuity of work, and once in post it is often difficult to keep supervisory staff. Whatever level of staff are employed, motivation is an acute problem in nearly all of the agencies interviewed. This may be attributed in very large part ot the short-term nature of such employment, and the uncertainty of future job proposals.

In terms of the kinds of skills that are imparted through schemes, a number of survey respondents in the Commission research feel that the development of countryside management skills doesn't train people particularly well for subsequent employment, since a majority of jobs in countryside management are on MSC schemes anyway! Some felt that skills development itself isn't particularly important in countryside work, since the main demand for environmental labour is for unskilled people.

A final problem with the development of MSC workforces is a political one. A number of employers interviewed in the Commission survey are concerned that MSC schemes in

the end simply displaces more permanent labour. Union objections to Community Programme schemes have been experienced by a number of agencies. This is particularly acute where MSC schemes are growing at the same time as established posts in authorities are being reduced. Within this debate about the displacement of jobs, however, it is recognised that the Community Programme employment structure does allow more work to be achieved on the rural environment than otherwise would be the case, possibly because of an element of labour exploitation. To counterbalance these problems associated with MSC schemes, there are a number of respondents who feel that training specifically in practical conservation and graphics does provide a real stimulus to future permanent employment. The existence of Government training schemes as a whole, too, had done a lot to develop the notion that jobs associated with environmental work can become a legitimate part of the rural economy. Permanent environmental jobs have expanded, chiefly as a result of initiatives started within MSC programmes. There is a need, however, for this process of permanent job creation to continue further.

Some of those interviewed feel that the main advantage of Community Programme labour is its cheapness, but a number also feel that it is useful in its flexibility. It has often been possible to reappraise project purposes in mid-stream to an extent that would not have been possible in a more structured employment framework.

What these researches are beginning to indicate, then, is that Government schemes have both created a significant increase in environmental jobs in the countryside whilst at the same time generating a very large dependence on such jobs for environmental work. Despite a significant number of problems associated with these schemes, respondents to both of the surveys cited above are largely in favour of their existence because of their general contribution to raising the importance of environmental work. Some feel that the schemes have caused a near revolution in countryside management, because of the high levels of manpower devoted to it.

Changes in the Structure of Government Supported Environmental Work

At mid-February 1988, the future of the structure of MSC schemes has just been announced. It seems that the MSC's new aim will be to retreat from employment schemes with

on-the-job training to concentrate more squarely on formal training. In the future, at least 40% of any individual's times will have to be spent in such formal training. Participants will be trainees rather than employees and thus will be paid only a training allowance - a topping up from existing benefit levels. They will be full time and trained for up to one year, but this training must be aimed only at local job market requirements.

These proposals are the cause of some concern, amongst partners in the Commission's research in two main areas. Firstly, it is widely felt that the focus on training will move the objectives of the Community Programme away from environmental enhancement towards the development of the individual. Although this clearly helps the individual, environmental improvements will thus suffer in terms of both quantity and quality as a result of this shift. The labour source of the existing Community Programme will diminish considerably and overall there will be a decline in environmental work in the countryside.

The training component, too, will cause significant problems for existing MSC agencies in that many of them simply do not have the facility for formal training. A number feel that they will be bound to withdraw from the Community Programme scheme as a result. The requirement for training to cater only for local needs is also a problem, since many agencies feel that it is hard to articulate what skills might be required in any one locality specifically for environmental work.

A second concern relating to the new MSC proposals arising from the Commission survey is that of the structure of benefits relating to Community Programme work. A number of organisations are concerned that changes to the benefit system will affect the calibre of the workforce. At present, Community Programme salaries are most attractive to young, single people, since the difference between their salaries and the benefit that they would otherwise attract is the greatest. The proposed 'benefit plus' system will act as a disincentive to this particular group & is likely, it is felt, to attract a larger proportion of older, less motivated people.

Environmental Work: Efficient Resourcing or a Low Wage Economy

Government employment schemes for environmental work in the countryside then, suffer from a number of problems and uncertainties for the future. In the face of this, does the development of such work really have a legitimacy in the rural economy? To begin with, it would seem clear that the current Government feels that such jobs are legitimate and important, otherwise they would have no place in a monetarist policy framework. It was Keynes himself who said that it was better to have people paid to dig holes and fill them in again as a means of stimulating economic growth, than to have them lying idle. Surely any jobs supported by public monetarist policies, in open opposition to Keynsian economics, would simply not be allowed this degree of futility!

A second area of the legitimacy of government supported environmental work, lies in its cost-effectiveness. Direct employment subsidies such as these Government schemes offer (total public income support) are the most efficient and means of financing such environmental work given that environmental goods are not themselves sold in a market that generates real streams of wealth to pay for their production. Certainly in the cases of agriculture and forestry, Slee (1981) has shown that it is much cheaper to pay farmers and foresters direct income subsidies than contrive complicated economic and fiscal policies to support their incomes, through product prices.

Four brief examples illustrate this. Firstly, in the Less Favoured Areas Directive of the Common Agricultural Policy, curiously, we subsidise farmers' livestock (through headage payments) rather than the farmer himself, as a means of sustaining the farmers' income. Secondly, in the dairy sector, the Government subsidies the production of milk and dairy products at a level for each cow, that is greater than the income of half the world's population. Despite these extravagencies, the incomes of both upland and dairy farmers remain below the national average, and in many cases allow only a marginal existence.

The second two examples come from particular Government conseration policies — Environmentally Sensitive Areas and management agreements under the 1981 Wildlife and Countryside Act. Under the MSC's Community Programme

environmental workers are paid a specific and direct wage to undertake conservation works with an unambiguous purpose, the enhancement of the rural environment. Under the former two schemes, farmers are paid often very large sums of money indeed to compromise their farming practices in pursuit of conservation goals. When farmers are paid up to 120 per acre per year in ESAs simply as income supplements and sometimes over 100,000 a year in a management agreement just to desist from some form of farm improvement, then the Community Programme environmental workforce must represent a more cost-effective means of environmental enhancement.

This cost-effectiveness, however, has aspects to it that have concerned a number of agencies in the Countryside Commission research. Firstly, the structure of MSC schemes as they have existed, and particularly as they are to be instituted do allow the maintenance of a low-wage economy. The 'benefit plus' system in particular allows the development of a rural employment sector with no career structure, and a wage level that is only 10 - 12 above that of unemployment benefit. Many feel that this is an unacceptable level of wage in the context of environmental work in the countryside in terms of the importance of the work undertaken, the important secondary effects on the rural economy and when compared to the extravagent means of public support to other rural sectors. Clearly a balance must be sought between a cost-effective mechanism for supporting environmental jobs and a realistic wage and career structure for such work.

A second concern about the current approach to environmental employment creation is that Community Programme jobs are accorded a certain impermanence and in over half the cases in the Countryside Commission research, only part-time status — a situation that is not (yet!) paralleled in either agriculture or forestry. Clearly the removal of this impermancence and uncertainty in a system of direct income support for environmental jobs in rural areas will do much to overcome many of the problems associated with the implementation of existing MSC schemes articulated above. The new 'benefit plus' system goes some way towards this in that it is aimed at creating full-time places for work and training, but the impermanence will remain — such positions are to be for a maximum period of one year.

Conclusions

There seems little doubt that working to improve the rural environment provides a legitimate sector of economic activity in the countryside. Such work will always be supported by the public sector, since conservation is a non-market commodity. Given this, it is argued here that it is much more cost-effective to support such work directly than through indirect subsidies relating, for example, to foregone agricultural incomes. A direct conservation labour force will thus offer more potential than if conservation is simply seen as one strand of agricultural diversification.

For such a force to be developed, however, four main problem areas now need to be addressed. Firstly, attention should be given to the existing problems of implementing Government-sponsored environmental work schemes. These relate particularly to the standards of work, supervision, training and motivation.

Secondly, a permanent employment structure should be developed in the execution of Government supported environmental work in the countryside. Since such work is likely to continue in one guise or another into the foreseeable future, such a structure would do much to resolve uncertainties about the nature of environmental schemes and would have the added bonus of ameliorating many of the problems of implementation outlined earlier in this paper.

Thirdly, the relationship between training and work on such programmes should be more clearly resolved to allow on the one hand clear training programmes to be devised, and on the other, fulfilling and strategically-designed work programmes to be executed.

Finally, all of these developments should be seen as a permanent and legitimate responsibility of the public sector, and funded accordingly. Properly devised salary scales and job structures will, in the long term, be cost effective, since they will allow the development of a cumulative expertise in environmental work in contrast to the current system, where public money is spent on training an environmental workforce which, after its allotted span on a training scheme, often returns to the dole queue taking its newly-found skills with it.

Acknowledgements

Thanks are due to the Countryside Commission for funds in support of this research. The views here are those of the authors and not necessarily those of the Commission.

References

The Association of Countryside Rangers (1987) The impact of the Manpower Services Commission in the countryside, The Ranger, Special Issue, Autumn.

Dept. of Employment (1987) Department of Employment Gazette, Vol. 6, December.

Slee R W (1981) Agricultural policy in remote areas, Journal of Agricultural Economics, Vol. 32(2), May.

THE USE OF TREES IN BARCELONA

Jill Ingram

BARCELONA IS SITUATED on a coastal plain between two rivers, extending to the lower slopes of the range of hills which protect the city from the north west. The climate is typical of the Mediterranean: dry winters and hot dry summers, with most of the rain falling in the spring and autumn. The annual rainfall of 600mm seems reasonable when compared with 700mm per annum for Edinburgh; but because it occurs in infrequent heavy bursts of up to 100mm per hour, efficient utilisation of the water is difficult. The climate influences the choice of trees which can be grown in Barcelona, and the way they are managed.

In pre-history, the native vegetation of the slopes behind the marshy plain was an evergreen oak forest of Quercus ilex and associated species, and although pockets of this type of vegetation remain on the higher slopes, once cleared for agriculture or destroyed by fire, the delicate balance of this ecosystem means it is not easily renewed, and such areas are colonised by pines: Pinus pinea, the stone pine, and P. halepensis, the Aleppo pine. Although these species occur in the open spaces of the city, particularly in the informal planting of parks on the periphery, tree planting in Barcelona is dominated by three species which are not native to the area: the plane tree, Platanus acerifolia, the date palm, Phoenix dactylifera, and the Italian Cypress, Cupressus sempervirens. The reasons for this dominance are both traditional and functional.

Historically, a cypress tree planted in front of a house in the country was an indication to travellers that they could expect to find hospitality within. Cypresses are also used traditionally in cemeteries, and they cover a wide area on the southern slopes of Montjuic where the

Jill Ingram is a recent graduate and diplomate of the School of Landscape Architecture at GlosCAT.

Placa Reial

Passatge Maluquer

cemetery for Barcelona is situated. At the turn of the century, palm trees were brought back from the Spanish colonies and began to take the place of cypress trees in front of important town houses. Both species are commonly used for the strong vertical, architectural elements which they provide, and palms are also used to unify city streets or squares (see figures)

The plane tree, Platanus acerifolia, is a hybrid of the oriental plane and a North American species, and was introduced into Spain some 600 years ago. It is the most common tree in the streets, avenues and city squares in Barcelona, being tolerant of air pollution and the cramped conditions for its root system, as well as the heavy pruning commonly seen in the city. The reasons for pruning are firstly to reduce the water requirements of the tree by reducing the area for water loss by transpiration; secondly to limit the growth of the root system and prevent damage to underground services; and thirdly to protect the security of nearby buildings which would otherwise be accessible to burglars climbing the tree! Skilful pruning can give an ornamental effect which is appropriate to the formal setting of these trees in their architectural role of unifying an avenue or square.

The range of species which can survive the hot, dry summers is limited. As it is, all the trees are watered regularly by lorry or, in parks and squares, by an irrigation system. The local authority, Servei Municipal de Parcs i Jardins, have produced a booklet "Arbres de Barcelona" which describes 57 species of trees which can be found in the city. Most of them can be found in El Parc de la Ciutadella, which was designed for the 1888 International Exhibition, and apart from one or two areas, is informally planted.

Other areas which have been informally planted are Parc Güell and Montjuic. Parc Güell was designed by Antoní Gaudí around 1900 and the ridge which forms a natural amphitheatre around the more formal area is planted with native species, pines, evergreen oak, olive, and carob, creating a woodland environment which is popular with local people walking their dogs or jogging, as well as providing a habitat for wildlife. For instance, red admiral butterflies, and the hoopoe, a member of the jay family, can be seen there. The gardens and parks of Montjuic were planted for the International Exhibitions of 1929, and again, in the informal areas, many native species have been used.

However, the majority of planting in Barcelona is along formal lines. This is clearly most appropriate along streets and in front of important buildings in parks or squares; but even where planting could be more relaxed, the treatment tends to be formal. This is partly tradition: clipped trees such as bay (Laurus nobilis) or evergreen oak (Quercus ilex) have long been very popular.

In the many small squares which have recently been refurbished, the planting is very sparse, in response to the heavy use (and misuse) inevitable in a city whose population density is said to be second only to Calcutta's. Also, in a country where landscape architecture does not exist as a profession, open spaces are designed by architects who view plant material as an architectural feature. Many of the recently designed parks use planting design based on geometric patterns and grids.

The local authority is attempting to introduce a wider range of species into their schemes within the limits of the climate, such as Ulmus punila var. arborea, the Siberian elm, which is resistant to Dutch elm disease. Prunus pissardii with its bronze leaves, Robinia pseudacacia and the leguminous Sophora japonica are now being planted along city streets as an alternative to the planes. The trend is to convert urban highways into avenues and boulevards by dividing up the lanes of traffic and incorporating wide pedestrian routes, and along the Diagonal (the great east-west axis bisecting the city) a number of different species have been planted, which help create local identity, assist with orientation, and provide a framework for small sitting areas for pedestrians along the route. However, the fact that mature palm trees are easily transplanted means that they will continue to be used by architects to create an early vertical element in new planting schemes.

The trees of Barcelona are an important element providing shade, humidity and greenery in a city where grass is a luxury. The traditional, functional and climatic restrictions on the choice of species used and their management has given a distinct character and identity to the city. However, when the "ecological movement" eventually reaches Barcelona's landscape designers, perhaps a further dimension of open spaces will be provided for people who are unable to reach the wilder areas in the Metropolitan Forest Park on the hills behind the city.

OBITUARIES

SINCE THE LAST ISSUE the School of Landscape Architecture has suffered the loss of three friends.

Pat Blockley died after a heart attack at the end of last year. Pat had been Head of the School of Planning in the late 1960's and early 70's. He was an active participant in the integrated curriculum run by the Faculty of Environmental Studies. When the Faculty ceased to exist we were able to retain Pat as a part-time teacher to our School, his specialism being the history of urban development. His lectures drew on his wide personal experience of gardens, landscape and townscape, in Britain and abroad, particularly in the Mediterranean countries, and were invariably illustrated in the most telling way by colour slides taken from his vast personal collection. The three hour summary of his 72 lecture series on urban evolution known as his 'marathon recap' was an experience not to be missed. Only one week before his death he had given a lunch time lecture to staff and students of the School. I shall miss Pat as a long time colleague and friend. His contribution to the education of many students passing through our School will however ensure his continuing memory and influence.

David Skinner was Head of the School of Landscape Architecture at Heriot-Watt in Edinburgh. His sudden death in January came as a great shock. I had known David for some years and he had been a member of the Landscape Institute visiting panel to Gloucester in 1984. He had in the past years also been an external examiner to our course, then in Cheltenham. He was kind enough to invite me to Edinburgh to advise on the setting up of their course. His cool logic may have appeared hard to some but his aim was simply to ensure the best. The profession will miss David. At the moment he received the accolade of being made Professor, he was taken away from us. His steady thoughtful influence would have been particularly helpful in the coming era of change in Landscape Education.

Mary Mitchell had lectured in the School on a few occasions and her work was used to illustrate a very special style of landscape design. Her influence on my own approach to landscape architecture was enormous. Having seen her work with landform and known of her work with children's play I was lucky enough to work with Mary in the early 60's. I learned so much from her as a designer and about the need to persist in one's pursuit of quality and I think her quiet but single-minded approach to landscape design still offers a great deal to anyone who chooses to investigate it.

Gordon Hyden,
School of Landscape Architecture,
GlosCAT.

BOOK REVIEW

American Gardens of the Nineteenth Century by Ann Leighton, University of Massachusetts Press, 1987

This book treats its subject generously, without being encyclopaedic, with something for most readers, be it horticultural, historical, social or literary. Most especially it will interest the British reader, for here we have presented to us a picture of a colony having shaken off its political and economic shackles but still retaining emotional ties to Old World culture what Washington Irving called 'this golden band of kindred sympathies' which only begin to loosen by the last quarter of the nineteenth century. Gardening events leading to this transition in the cultural life of the new nation have been outlined in earlier volumes by the same author providing a useful historical perspective to which reference is made throughout this posthumously published last volume of a readable and instructive trilogy. The 300 pages of text are interspersed with frustratingly small though fascinating illustrations and appended by a further 80 pages of plant lists which are from nurserymans lists and not, rather annoyingly, from gardens. Rather than attempt a comprehensive gardening history, the author identifies a series of interconnected events that carry us through the century and serve to illuminate this aspect of an emerging national culture.

For students of British gardening familiar with the world-wide exploits of plant collectors it is interesting to learn that American collecting was mainly limited to the frontier as it progressed westward. If this strikes a somewhat insular note we are soon shown how influential Old World botanists and gardeners were in many other areas of American gardening. European cultural influence on Jefferson is well known but in the world of gardening was more specifically exerted by the activities of botanists Drummond, Poinsett, Rafinegue and Yorkshireman Thomas Nuttal, who is here identified as of particular influence. In addition we are told that German gardeners were in great demand in Washington's day and Scottish gardeners, becoming fashionable perhaps as a result of Loudon's authority, later in the nineteenth century.

Contemporary with Loudon was Bernard McMahon who, as a nurseryman-author, laid the foundations of an indigenous horticulture and in so doing maintained the reputation, established by the Bartrams, of Philadelphia as a horticultural centre. Part of that reputation must have rested on the popularity of 'horticultural gardens' which became places of popular resort in the absence of public parks, a phenomenon noted by Loudon in his encyclopaedia, as occurring in London.

The English connection is repeatedly made. The remarkable David Hosack, son of a British artillery officer and schooled in 'British-occupied' New York, established that city's first botanic garden where the Rockefeller Center now stands and, together with Parmentier, was the first to use a 'natural' style of gardening at the beginning of the century. Downing and Olmstead may have been native-born Americans concerned with the promotion of a native style of landscape design but their debt to European influences was as profound as was Vaux's contribution to American park-making. Though well researched and widely understood, the story of Olmstead and Vaux's park-making is rehearsed again here. If it was necessary to repeat this familiar story what a pity it could not have been prefaced by an evaluation of Charles Mason Hovey's role in promoting the idea of American public parks. This Massachusetts nurseryman was it seems, according to Melanie Simo's new biography of Loudon, a visitor to the newly opened Derby Arboretum. His admiration for Loudon's work and the respect he enjoyed throughout the U.S.A. could have provided at least part of the early impetus that is most often ascribed to others.

When the drapes of high design are pulled aside, charming vignettes of ante-bellum society are glimpsed, of gardens with family burial plots and the privies immortalised by the legendary Lem. Putt. That other peculiarly American phenomenon, the 'country place' is examined. It was, according to Sargent, of two types deriving from its method of formation by the axe or by the spade, the former a woodland garden, the latter a horticultural garden. Interestingly, Leighton claims the Robinsonian wild garden to have not been popular in America because 'wilderness seemed too close to invite for a social call'. Robinson's celebrated opposition to carpet-bedding is coupled here with the rise of exhibitionism, where the garden ceased to be for the enjoyment of the inhabitants of the house but for the purposes of impressing the passer-by.

The serious is juxtaposed with the zany to maintain a lively pace: the importance attached to botany in children's education and of its introduction to ladies in verse, the 'patriotic and Christian' values associated with cottage gardening and those attaching to a Newfoundland dog 'executed in pressed "black" holyhocks and grayish moss' can hardly fail to fascinate the student of nineteenth century gardening.

C.M.Young,
School of Landscape Architecture,
GlosCAT.

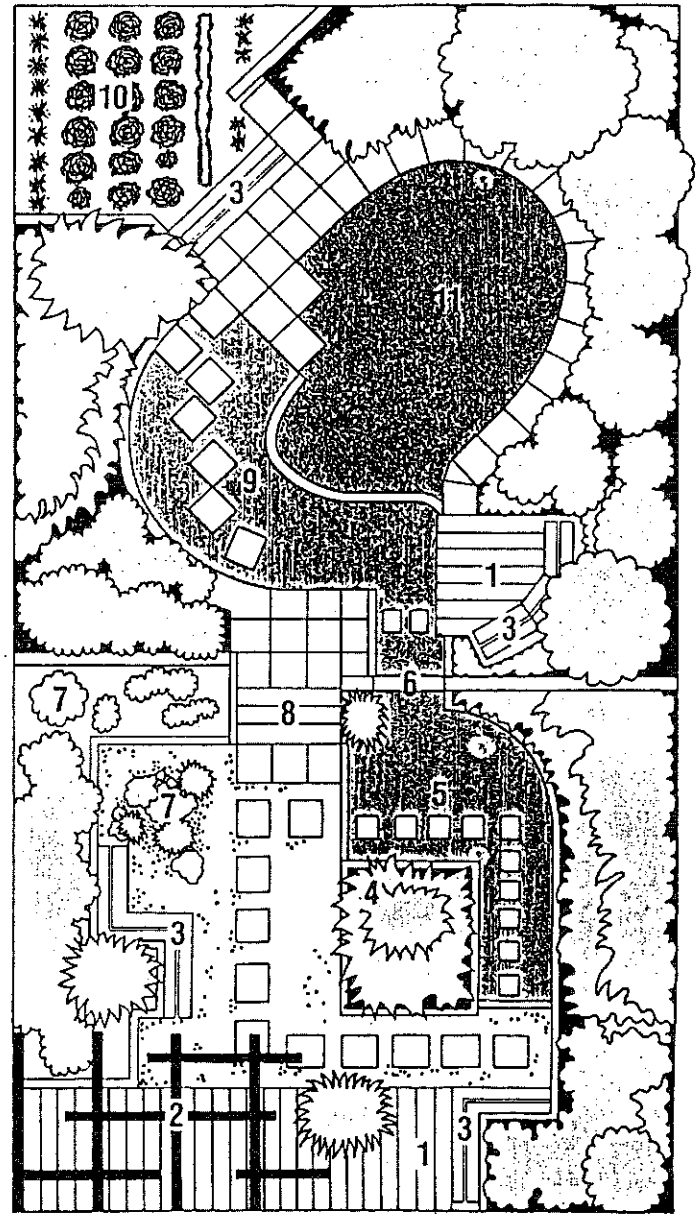
WINNING GARDEN DESIGN

CONGRATULATIONS ARE DUE to Sara Lavigne of the School of Landscape Architecture, GlosCAT, for achieving first prize in the 1988 Daily Express Garden Design Contest (Student category) at the Chelsea Flower Show. The brief specified a "garden of quality" for a modern house containing elements of water, paving, plants and vegetables. Sara's scheme was based on a two-level idea with a water feature cascading from an upper pool into the lower section. This visual link was complemented by pathways of different materials adding variety and leading the visitor from the house to the vegetable plot at the top of the garden. As regards planting, the basic structure was of evergreens to provide all-year interest, punctuated by deciduous, often variegated, species to afford colour and accent.

STAFF RETIREMENT

The longest serving member of staff of the Gloucester School of Landscape Architecture took voluntary early retirement at the end of 1988. John Simpson was appointed in 1965 to the Faculty of Environmental Studies then located in the College of Art and Design in Cheltenham. Following the resignation of Michael Lancaster, he took the role of caretaker Head of School of Landscape Architecture until the appointment of Gordon Hyden in the early 1970s. His expertise was wide-ranging and he taught construction and engineering to the landscape students as well as planning and planning law in both the landscape and former planning schools. From such a base John maintained a continuous involvement in consultancy, mostly related to surveying, reservoir design, drainage and numerous planning enquiries. But perhaps most of all John will be remembered for the important work of admissions tutor to the course: over the years he was responsible for processing the literally hundreds of applications and interviews for prospective students. In no small measure are we in debt to John for this essential administrative task, and most students, both past and present, no doubt if asked, would declare that their choice for GlosCAT was influenced to a greater or lesser degree by John's warm and reassuring personality. I am sure they would want to join the staff in wishing John all the best in his continuing professional commitments and well-earned retirement from academic life.

R.J.M.



KEY TO GARDEN	4. Raised Bed	8. Steps
1. Timber Deck	5. Pool with Stepping Stones	9. Raised Pool
2. Pergola	6. Waterfall	10. Vegetable Plot
3. Seating	7. Rock Garden	11. Lawn

The School of Landscape Architecture
Gloucestershire College of Arts & Technology

Volume 5
Number 2
November 1988

LANDSCAPE ISSUES

LANDSCAPE ISSUES

Volume 5, Number 2, November 1988

Articles, notes and reports on a wide range of landscape issues are accepted for publication. Particularly welcome are contributions relevant to the education of landscape architects. Write to the Editor for further information.

Editor : *Robert Moore*
Cover design : *Jill Steeves-Booker*
Word-processing : *Lyn Johnstone*
Printing : *Stoate and Bishop (Printers) Ltd., Gloucester and Cheltenham.*

Landscape Issues,
School of Landscape Architecture,
Gloucestershire College of Arts & Technology,
Oxstalls Lane,
Gloucester, GL2 9HW Telephone: (0452)426774

Publication is twice yearly, and subscription is £5.00

ISSN 0265-9786

DIGESTING THE ISSUES

Volume 5 number 2 is the tenth issue of this periodical. At its inception in 1984 its chief objective was to publish research work that was relevant to the landscape professions and of specific interest to the education of landscape architects. Contributions were to be of fully developed articles or written as short notes or reports. Most submissions that reached the publication stage were from the teaching staff of the School, as was expected, but there was a significant (and increasing) number of student contributions as the journal developed. Of the number of articles written by "outsiders", those published in two particular issues are noteworthy: those celebrating the School's Hungarian and American contacts. In them colleagues from the Horticultural University in Budapest, Michigan State University and the University of Montreal wrote principally about matters of landscape education.

Other regular features in Landscape Issues have included book reviews and an annual list of student degree dissertations from the School. Many of the student articles that were published grew out of or were edited versions of their dissertations. Student research is a much under-used resource and it is worth noting that the Landscape Institute library keeps records of dissertation titles from all the English schools educating landscape architects.

To mark the tenth publication and to assist in information retrieval much of this issue is given over to cumulative indexes. Apart from the lists of authors and the book reviews perhaps most useful to readers are the detailed keyword index and the cumulation of dissertations assembled under subject headings. These dissertations are all shelved in the GlosCAT library on open access and copies of abstracts are available through the post.

In the five years of life of this periodical much has happened both in the landscape profession in this country generally, and to the School of Landscape Architecture in GlosCAT in particular. Tracing through the past editorials highlights some of the major changes. 1984

saw the first Garden Festival in this country which was heralded as a milestone for the profession, and with Gateshead preparing the fourth in the line of such events we can safely say that they are now very much part of the established landscape scene. This decade has also witnessed the flowering of computer applications in landscape architecture. The early fear that the computer may be a retrograde technique in design was seen to be unfounded, but despite the proliferation of machines and software, acceptance and regular use of the technology is still unfortunately somewhat superficial.

The appearance of Halley's comet in 1985 was very disappointing, yet the editorial of that year urged both design inspiration from nature as well as an aesthetic appreciation of the more fleeting, less tangible environmental phenomena. Our fifth issue coincided with the 25th anniversary of the establishment of the School in Cheltenham. The foreword gave a potted history of undergraduate education of landscape architects in Gloucestershire. The foreign study tours and staff exchanges undertaken by the School were fully discussed in successive issues, emphasising the value to intending landscape architects of experiencing at first hand examples of good historical and contemporary design from other cultures.

Video technology has been widely promoted but its use in the design professions is only now being fully realised. 1987 saw the first application of video recording to visual impact analysis in student project work in the School, and whilst cost limits its development to film and television companies, it has much potential at a more modest level as a design tool, especially if linked to the complementary technology of computers.

As the decade draws to a close, it is curriculum matters which are causing most debate in the schools of landscape architecture. The last editorial dealt with the identification of core topics and the need for landscape educationists to re-appraise the methods and content of their courses. This re-appraisal process should be informed by, amongst other things, current research both in the central activity of landscape architecture as well as in the wide range of subjects and fields which are the foundation of landscape studies. It is hoped that Landscape Issues, as well as its more widely-known sister journals, will continue to play its part in publishing and promoting such landscape research to a growing profession.

SINGING CORN, WHITE BLOSSOM TOO

Martin Spray

> Many have sung the summer's songs,
> Many have sung the corn,
> Many have sung white blossom too,
> That stars the naked thorn.
>
> Vita Sackville-West
> The Land

In our tradition of landscape design, the major emphasis is usually placed on aesthetics(1). In particular, the look of the vegetation — the way it is appreciated through the eye — is all important. This sense of "aesthetic function", which is essentially that of the visual artist and designer, is somewhat limited, and is not necessarily the emphasis given by other people concerned with and about vegetation.

It stems, of course, partly from the obvious fact that sight is our predominant sense; but also from the fact that our understanding of the concept "landscape" derives from the usage of the artist and the art historian. In Old English (Anglo-Saxon), "landscape" meant the essence — the whole feel — of the land; -scape, in fact, is from the same root as -ship, as in "friendship". Only much later, with the innovations of Dutch landscape painting, did "landscape" reappear with its secondary meaning of "a particular tract of land as presented to the eye" — in other words, a "view". We design for the eye: we design views, even at the small scale. We have given pre-eminence to a relatively sophisticated "function".

I want, in this paper, to give an emphasis — in fact several emphases — different from this narrow one. Not because I consider the look of a landscape to be unimportant; but because the landscape (and its

Martin Spray is biology and dissertation tutor in the School of Landscape Architecture, GlosCAT, edits Ecos: A Review of Conservation, and occasionally visits Serendip.

constituent vegetation) has several other "functions" besides that of being looked at, and because I consider some of them rather undervalued — neglected or ignored — by the landscape architect ...

---II---

Man has a number of other senses. We acknowledge this in one particular context: we design "blind gardens", where sightless persons (and others) can smell and hear plants, as well as feel them. Why do we normally make too little of these other senses for sighted persons?

It has been said (I forget by whom: I don't think it was a biologist) that smells evoke memories more effectively than any other stimuli: yet mankind's sense of smell is relatively weak. This weakness notwithstanding, some other cultures (especially, of course, those with Mediterranean climates and floras) make considerable use of scented flowers and aromatic foliage in their designed landscapes — and so do many British gardeners. British landscape architects, however, do not much design for the nose. Except for the use of fountains, and the planting of an occasional Populus tremula, we do not much design for the ear, either — let alone for the tongue(2).

Britain has an enormous vandalism problem — not unexpectedly, in view of the social and environmental tedium in which most young people have to live. This is the excuse — vandalism — usually given for not encouraging tactile experience in designed landscapes — we are not encouraged to touch most of our surroundings, just as we are not usually allowed to handle enticing sculpture (except, again, in special exhibitions for the blind!). This excuse draws attention away from the fact that our society tends to condition us to be non-tactile: we have numerous inhibitions about touching things, and other people — and even ourselves. It is not surprising, therefore, that at present designers are not encouraged to produce landscapes in which the public can physically experience their surroundings fully. "Keep off the grass" is often a needless and automatic injunction.

I would, then, identify our present "use" of vegetation (at least that which we call landscape planting; but I think the generalisation holds for most other non-productive vegetation, too, and even for some that is productive) as predominantly aesthetic. It is, moreover, to a very large extent devised so that it is culturally meaningful, rather than naturalistic (the difference here is something like, but to a considerable extent also

unlike, that between non-representational and representational art). In other words, it is intended to be "recognisable", familiar, comfortable and obviously man-made. Another way of putting this, of course, is that it is inclined to be stereotyped.

Whereas our designed landscapes are (presumably) meaningful in terms of the culture of the people who design them, one wonders, for example, whether or not our English tastes are very meaningful to, say, Sheffield's Blacks or to Bengalis in the East End ...(3). Indeed, one wonders if landscapes designed by middle class professionals, taught within a largely middle class milieu, are entirely meaningful to all the people for whom they are provided. Considering the highly unusual high degree of expertise offered the landscape profession by them, it is surprising that women, also, appear often to find our landscapes difficult to use and not entirely meaningful — as though too many women designers have taken on a "masculine" approach in their work. Moreover, I wonder if these landscapes are meaningful to children, and to the elderly: but more on these later.

Many aspects of the intended "aesthetic function" of landscape architecture are based on ideas and ideals culled from the fine arts — and are manifest very clearly in our elaborate graphic presentations. Forms from graphic and sculptural art do not necessary accommodate non-visual "functions". Nor are they necessarily understood in aesthetic terms by people who are not accustomed to such artistic forms (I am thinking of Western bourgeois preferences in "conjunction", "balance", "context", "weight", "articulation", "movement", etc). Many people reject the established preferences in the fine arts: they may not accept them in landscapes either ...

(What am I saying? I am writing this in a small, run-down, East End of London park, with spring bulbs in flower: a shrub border with Narcissi, mature Plane trees and three winter-planted circular beds — two with Tulips and Polyanthus, one with Pansies. It is much appreciated by the local inhabitants and the regular down-and-outs. By a daily rearrangement of seats, it becomes a social area for kids in the evening; and (by ignoring the flower beds!) they just about have room for playing football. If it were submitted as a park design by a present day landscape student, it would receive little praise. Yet — within its context — it does "work": it is used, and it survives. The designer should always remember that she or he is part of an élite group.

Sophisticated, complex and avant-garde solutions may look good, but may not "work". Similarly, some of the attempts by innovators to use vegetation naturalistically are unwelcome to many of the people who are expected to live with them, partly because they are not culturally meaningful to them: the designer is pressing ahead too fast, forgetting that we are culturally conditioned.)

---III---

Perhaps this is an appropriate point to try to make, at least in my own terms, a comprehensive list of ways in which we use vegetation. Such a list might be:

- for viewing
- and for experiencing (more) fully
- for "prospect-refuge"
- for privacy
- and for screening
- for playing on
- and for playing in
- for adventure
- for education
- and for research
- for conservation
- for ameliorating microclimates
- and for production.

So far we have examined only the first pair of uses. Before dealing further with this list directly, I want to introduce a subsidiary question, and ask: Who uses vegetation? I shall hint at part of my own answer to this through a quotation from Colin Ward:

> The failure of an urban environment can be measured in direct proportion to the number of "playgrounds". This failure is in direct proportion to the blatantly unsuccessful attempt to compensate for the general tedium of the urban scene by furnishing special sites with clusters of tube-steel, railway sleepers and sewer pipes(4).

Except when designing playgrounds, which are intended to segregate children's activities from those of adults (and which, moreover, tend to reinforce the view that all children do, out of school, is play — unless, of course, they are vandalising something), or schoolgrounds (which, in this country, are still only seldom used for out-of-school activities), we are almost always designing with use by adult members of society in mind. What is in

mind, indeed, even in the designs of most students, is a preconceived mature (but not old) adult. Adolescents, just like young children, are usually catered for in deliberately segregated areas — and these are usually indoors ...

One of the sadnesses of being — or thinking — like an adult, is that one is apt to forget how to play. Landscapes intended for and used by adults are not usually very "playable" — that is, they are not very "adventurous"(5).

I do not pretend to know what sorts of planting — if any- would be satisfying to the majority of adolescents in this society; although plain grass is used by many, just as it is by children. It is certainly easier to see what sorts of vegetation can be used by people who still play. It is also easy enough to see the sorts of places favoured by youngsters (and some of the not-so- young) not for play, but for lovemaking. Yet I can think of no instances where this "facility" has been specifically designed. For sex just as with play, there is a need for privacy, for refuge, for conducive surroundings; but in both cases the need is so often either ignored or excused on the grounds of not wanting to make places dangerous. (Yes, dangers there are; but they must also be tackled in other ways.)

Jay Appleton has clarified for us a "prospect-refuge" theory of landscape(6). He supposes that we have a preference for staying safe and relatively private while we enjoy the view (or *other less extensive prospect); the equivalent, perhaps, of viewing one's estate from the ramparts of the castle. Perhaps his idea should be significantly amended for a sizeable part of the population. It might re-emerge as a "prospect-refuge-adventure" theory.

Serendipity in landscapes — their ability to provide interest in the form of what the Americans call the happenstance — is greatly valued, notwithstanding the continued reliance on conventional forms of design and planting. It was an important aspect of the ha-ha, as well as of the tantalizingly sinuous lake, the hill-behind-the-next, and the sudden speckle of colour in an unimproved meadow. "Creative play" is to a large degree encouraged by serendipity. So is education — which, of course, most children's play is.

Alas, many adults are too restricted, physically and culturally, to wish for, let alone make use of, this sort

of "adventure". For them, conservatism and familiarity in design and planting may be most satisfying. And here, in a way, of course, I begin to argue against myself; for, for the habitually conditioned person, the view — the design of the eye — is perhaps the most important thing about landscape ...

If "views out" are a component of "prospect-refuge" landscapes, so is privacy. Whereas some people head straight for the rookeries of the Med and other beaches, others — singly, or as couples, or as families — seek out intimate spots, very often "cells" or "bays" defined by vegetation. One of the attractions of woodland, bushy heath and derelict shrub and bramble infested pasture, is that here many people can find a sense of seclusion, albeit close to other people finding the same thing.

Other things find privacy too. The commonest sorts of landscape planting produced in this country have often, with some justification, been dubbed cosmetic (7). Some very clearly is, for it is used to cover spots and cracks, to draw attention away from eyesores, and to pretend that there really is no ugliness behind. This is the business of screening(8).

Recently, much emphasis has been put on the "educational value" of certain areas and types of vegetation. Fieldtrips to beautiful countryside are justified in terms of biological, geographical or environmental education. In the cities, educators and naturalists are re-discovering the educational value of semi-natural vegetation, in such places as neglected corners of parks, wasteground, or specially designed "nature gardens" in school grounds. "Conventional" landscape planting can be used for natural history and other studies — but its value is a remarkably slight one: for the very fact that it is conventional; it lacks diversity and it lacks serendipity.

The sort of vegetation which is increasingly being advocated for educational purposes, and for purposes which I shall note later, can be described as naturalistic; that is, in terms of composition and/or structure it is much closer to natural vegetation than to "conventional" — more or less horticultural — planting. There are, indeed, a number of educationists urging greater use of spontaneous vegetation, either existing on wasteground, or deliberately planned in "nature reserves" within schoolgrounds. To a small extent, but increasingly, landscape architects are being asked to step out of their "conventional" role and ideas, and

"design" spontaneity. (We are back, I think, to what I have called serendipity...).

Providing vegetation (or landscaped areas generally) for specifically educational purposes is only an occasional, and specialist, brief. Providing it for "conservation" purposes is becoming a quite frequent occupation. Perhaps such a brief is equally specialist; but it is becoming an accepted one for landscape architects.

Usually, what is meant is "nature conservation"(9). The "native species" and "new directions" debates have been continuing for some years now (10), and increasingly people are agreeing that, in many circumstances(11), we should make greater use of naturalistic vegetation, not merely because it can be very attractive, "functional" (for example, by providing privacy) or cheap (which is still contentious), but because it both consists of more (native) plant species and supports a far greater diversity of animal species than "horticultural" planting. We should, it is argued, increase the extent of such vegetation, in urban and rural landscaping projects, because of the continuing "loss of habitat" for which this to some extent compensates.

Again, one can see here divergences, between the views of younger members of society, for whom spontaneous or naturalistic vegetation is usually much more "playable" than conventional planting, and those of older members, who wish to enjoy more symbolic (if simplistic), formal, designs. And there is, of course, still only a minority of public and professions alike who want much more naturalism. Nonetheless, the potential contribution to nature conservation is a real and significant one; and one which should become more important in the future. The slowly increasing involvement of the landscape profession is a welcome sign. One can see that involvement with spontaneous semi-natural vegetation, rather than designed and planted vegetation, will figure more prominently than it does at the moment.

Under the heading "conservation", one should include reclamation — conservation is, after all, "the careful husbanding and exploitation of resources", including land. Planting for reclamation is widely carried out, often using "whatever will grow", and often — initially — with little reference to aesthetics. In some ways, even plantation forestry in the uplands counts as a form of conservation: reclaiming degraded upland landscapes to more productive use, and increasing overall biomass.

Conservation is a part of environmental control(12). Plants are used for other aspects of environmental control — indeed, this may have been their earliest "landscape" use in cities. Trees shade from the sun, intercept rain and snow, and diminish the effects of wind funnelling and eddying between buildings(13). "Blankets" of vegetation trap re-radiated heat from the ground, and cut down heat loss from buildings. Dense tree and shrub belts, in association with earth mounding, can be used to absorb and deflect noise. These aspects are already dealt with by landscape architects. The value of vegetation for combatting airborne pollution is also receiving their attention. Amelioration of microclimate, improvement of soil, reduction of the effects of pollutants — these are all areas where greater expertise and involvement are necessary. Their importance is enormous — perhaps as great as the "aesthetic functions" of plants in built up areas.

Perhaps one might also see more involvement of the designer with that last category of use of vegetation: the husbanding and exploitation of plant (and animal) production. Even with set-aside, most of Britain's plant cover is productive — that is, directly or indirectly (via animals) we crop it in some way. Even most recreation heath and grassland is grazed; much broadleaf woodland still provides some timber. Commercial forest, "improved" grassland, and ploughland, of course, are obviously cropped; and have hitherto been largely out-of-bounds to the landscape designer, except for the amelioration exercise of shelterbelt design. Yet, along with the interest in nature conservation, there is increased interest in the exploitation of some "visual" planting by cropping. Fuel and labour costs are putting more sheep, cows and deer back onto amenity grassland. Coppicing is back in fashion; and it can yield valuable pole wood for fencing, or even for pulping. Urban farms in some cities have negotiated grazing in parks, or have grass cuttings delivered as fodder. We do not know what potential might emerge from more widespread naturalistic planting.

---IV---

I have emphasised the diversity of ways in which what we might call the more "concrete functions" of vegetation are important to us. I have neglected the aesthetic, not because that "function" is less important, but because landscape architects usually give exaggerated prominence to it. There is yet one area of "function" to be explored, and it concerns some root biological ones.

Quite apart from helping us to make and keep soil, to clean the air, to reduce the rate at which we are inducing "greenhouse" effects — and quite apart from their obvious role as food — plants are biologically needed. There is what has been called a "primal association": a psychic need(14). Green is calming; flowers are therapeutic; growing them is even more so. And there is more. Flowers are almost universally symbols of love and friendship and respect. The gift of a flower — and its receiving — is a profound gesture(15).

Vegetation is represented all around us, more-or-less artistically, both as High Art and as low. (Landscape designers, of course, can use it in both ways.) Plants are there in our culture, even when not physically so: culturally, symbolically, psychologically we are so sophisticated a culture that we need education to show us some of these things. And education needs research.

More research is needed. Serendipity again... Landscape architects per se have not been very prominent as researchers in this country. I suspect that if the importance of their characteristic medium — vegetation — were more widely expressed in terms other than of aesthetics, this might not remain the case. Has any landscape architect yet looked for the Yggrasil?

NOTES

1. I do not wish to imply that it is otherwise in other cultures. Traditional Chinese and Japanese landscaped gardens, in particular, are designed for the eye — and for the poet, of course ...

   What will remain as my legacy?
   Flowers in the spring,
   The cuckoo in summer,
   And the crimson leaves of Autumn. Ryokan

2. See also M. Spray (1983) But does it smell right? Town and Country Planning 52 (7/8):200.
3. This point is picked up by Julian Agyeman (1989) Black people — White landscape, New Ground No. 22:6-8. A brief M.A. dissertation for the University of Sheffield by Helen Sharman (1987), Different cultures, different needs?, indicates how little we know about cultural needs.
4. Colin Ward (1976) The Child in the City, Architectural Press.

5. I have touched on "playability" in Landscapes of Serendip, Town and Country Planning 52(2):52-3, 1983.
6. Jay Appleton (1975) The Experience of Landscape, Wiley.
7. See P.H. Selman (1976) Environmental conservation or countryside cosmetics? The Ecologist 8(9): 333-5, for a related discussion.
8. John Whitelegg (1989) uses a different image: that of "cleaning up the foul messes left behind by others, while failing to prevent the mess being produced in the first place". The nightsoil profession, Landscape Design no.185:2.
9. For a quite different intention, see e.g. D.G. Pitt, W. Gould, & J.E. Green (1982) A new approach to conservation — Energy consumed by the landscape; and A Case Study, American Nurseryman February 15th.
10. The arguments are well rehearsed. See e.g. A.R. Ruff & R. Tregay (eds) An ecological approach to urban landscape design, University of Manchester Department of Town and Country Planning.
11. There are, however, other situations. See e.g. M. & J. Spray (1984) Provoking the natives, Ecos 5(4): 19-25, and Landscape Issues 1(1):12-22.
12. There is also the growing field of "bioengineering". See H. Schiechtl (1980) Bioengineering for land reclamation and conservation, University of Alberta Press.
13. See also A. Ferguson (1988) Vertical landscaping, unpublished dissertation, GlosCAT.
14. E.g. E. Conklin (1972) Man and plants — a primal association American Nurseryman November 1st: 42, 46-9. The Americans, at least, take it seriously; e.g. H.W. Schroeder Psychological value of trees: measurement, meaning, and imagination, in Proceedings of the Third National Urban Forestry Conference, Orlando, Fla., December 1987, comp. A.F. Phillips & D.J. Gangloff. See also C.A. Lewis (1976) People/plant proxemics: a concept for human design, in P. Suedfield & J.A. Russell (eds) The Behavioural Basis of Design, Bk 1, selected papers/EDRA 7, Dowden, Hutchinson & Ross, Stroudsville, Pa.
15. My copy of Vita Sackville-West's The Land (1926, Heinemann) is secondhand. Its first owner had pasted a quotation inside the cover: "If a man finds himself with bread in both hands, he should exchange one loaf for some flowers; since the loaf feeds the body indeed, but the flowers seed the soul." (Mahomet).

KULTURLAND-LANDKULTUR

Michael Ivory

This was the principal theme of a symposium held in October 1989 in the Department of Landscape Architecture of the University of Paderborn which is located in the small historic town of Hoexter. Roughly translated it means "Agriculture — Countryside Culture", and the purpose of the gathering was to increase awareness of the need for a new socio-cultural foundation for a European countryside fit for people, culture, and nature.

A relatively remote part of the Federal Republic of Germany was a suitable location for such an occasion. West Germany is often thought of by British landscape architects as a kind of Mecca; the landscape of its cities is overseen by wise, landscape architect-led parks departments, well-funded, expert in planning and detailing; its national and regional garden festivals, as well as attracting the necessary millions of visitors, also contribute to the steady build-up of permanent landscape resources. In many parts of the countryside it is now usual for thoroughgoing landscape plans to be prepared, not just in exceptional cases such as areas affected by mining of quarrying, but also for ordinary tracts of rural land in order to integrate farming, forestry and tourism, control development, conserve historic features, promote ecological diversity and so on. But the result? "Kein schoenes Land" (not a beautiful country) according to the title of a recent article in a popular magazine.

This prosperous, well-ordered, carefully-planned society has produced a habitat which, however enviable it may seem to us (and to many East Germans), is nevertheless lacking in certain essential qualities. Leaving aside the question of the quality of the urban habitat, we might say that four decades of an apparently rational approach to the management (in the widest sense) of the German countryside has in the end given rise to landscapes which may be technically satisfactory (but not always that) but which, in human terms, are user-unfriendly or even absurd. Thus the German forest,

Michael Ivory is a senior lecturer in the School of Landscape Architecture, GlosCAT. He is a linguist with a specialism in German.

the source of so much specifically Germany feeling and poetry, is being destroyed. (But the market leaps to the challenge, and the unthinkable is turned to good use; a local tourist bureau hopes to make "Bergwandern in der Tundra" — mountain hiking through the tundra — an acceptable substitute for lost woodland pleasures.) Margaret Thatcher's tank trips through the Lueneburg Heath seem a minor environmental irritant compared with the progressive replacement of the heaths themselves by grassland, a result probably of the same pollutants that are wrecking the forests. But whereas the disappearance of heaths and woods was unforeseen, even greater changes to the physical, ecological, social and cultural structure of the countryside have been the result of deliberate agricultural policy. Most of the farming landscape of West Germany has, quite quickly, been transformed, by the process of Flurbereinigung (consolidation) as well as by the array of EC agricultural policies. Not only has the rich pattern of strip farming almost disappeared in favour of large, consolidated fields, but old lanes, hedgerows, individual trees, streams, ponds have gone too. There are now parishes in Germany with no trees. This razing of a landscape structure built up over a thousand years is paralleled by a government-promoted decay of the social structure; small farmers are quitting the land, rural life is becoming moribund, facilities of all kinds are more difficult to sustain and rural values are giving way to urban ones.

The contributors to the study day filled out many details of this depressing picture. Professor Konrad Buchwald, formerly of Hanover University, and a figure comparable perhaps to our W.G. Hoskins in his knowledge of landscape history, examined the evolution of a number of North German landscapes, including that of Lueneburg Heath. In common with Professor Hermann Priebe, the West German authority on agricultural landscapes, he stressed the need for fundamental, political change in the way rural landscapes are managed, in order for their "livability" to be restored. A word used by both speakers was "Heimat", whose multiple meanings will be understood by anyone captivated by the television village epic of that title. Impossible to translate by a single word, it covers the range from "homeland" to something like "my place", "where I come from", and until recently has not enjoyed much of a vogue in consumer-orientated West Germany. Both speakers made a strong plea for a conscious search for the qualities which make the countryside a distinct human habitat and for their deliberate promotion, not by superficial "landscaping"

but by the encouragement of all the potentials of rural life. Priebe saw this, not as a return to a "museum landscape" (although much was to be learned from the great advances made by agriculture in the hundred or so years up to World War Two), but as an advance to a farming culture respectful of people and using advanced technology in harmony with immutable natural laws. He elaborated a 10-point programme for this, based on an optimism that the climate of opinion, at least in Germany, was changing rapidly, and that agriculture, "which furnishes the living-room of our society" must be ready to change with it.

Other speakers responded to these themes in their own ways, by emphasizing the possibilities for change by the individual (Professor Meyer-Albrich), by celebrating the values of rural civilisation as opposed to urban barbarism (Professor Anna Wolf), by pointing to the revitalisation of life in a rural area in France (Juergen Kloetgen). It was left to Michael Dower, president of ECOVAST (European Council for the Village and Small Town) to present an overview of rural revival in Europe as a whole as well as drawing attention once again to the Romanian government's dire policy of "sistematization", the destruction of the "Heimat" of Romanian, Hungarian and German villagers in pursuit of a millenial, rational settlement pattern which will replace the wealth of ancient villages with a planned pattern of barbaric agro-towns. It may be possible to draw parallels, historic or more recent, to such callous treatment; a deliberate act of policy cleared the Scottish Highlands, whereas the flight of country-people to the towns in the 20C has mostly been due to the blind workings of economic necessity. But at a time when there is a quickening concern for the well-being of the European countryside, the action of the Romanian government seems particularly aberrant.

1988 DISSERTATIONS: BA Hons (Landscape), Gloucester

The following is a list of the successful degree dissertation submissions for 1988. These documents can be consulted in the College Library and abstracts may be obtained from the Librarian on receipt of a stamped addressed envelope.

Therese Alison	Power station developments: the conflicting interests for our diminishing countryside. A study of Dinorwic.
Victoria Allen	Green networks: a review of open space provision, advocating linked networks as an improved form of urban design.
Jayne Atherton	School grounds: their potential as an environmental and educational resource.
Louise Bebb	The environmental effects of using herbicides and their alternatives.
James Braybrooke	Reservoirs: their potential for multi-purpose development.
John Briggs	The evolution of landscape design in Britain's 20th century New Towns.
Stephen Caffyn	Planting in zoological gardens.
Elizabeth Croft	Garden festivals: the involvement of the horticultural industry and the landscape architecture profession.
Michael Davies	Developing a landscape strategy for the china clay industry in Cornwall.
David Dutson	Painting into landscape: the changing influence of painting on English landscape design, 1750-1800 and 1945-88.
Angus Ferguson	Vertical landscaping: the potential benefits and limitations from its implementation in urban areas.
Tracy Giles	Afforestation and conservation: the Flows.
Catherine Griffiths	Therapeutic landscape and application for the mentally ill.
Dinah Higgins	Use of urban open space: a study of an evaluation system.
Julie Hughes	Sculpture within the rural environment: its development and present day implementation.

Dionne Jones	Season dynamics and the aesthetic treatment of non-woody plants.
Aine Patton	Man and nature: a religious or scientific (humanist) conception of nature for the landscape designer.
Jane Shadwell	From this day forward: the role of the landscape architect within the District Council framework of England.

Fig 1 Site plan showing existing and proposed contours

[The design illustrated was produced by Adrian Matthews, a second year student, and the site is Barnwood Grange, in Gloucester]

PRIME CUT AND FILL

Richard Woods

A new computer program has been developed on the Prime mini computer at GlosCAT to assist in cut and fill calculations. It is essentially a fairly simple inter-active program that compares earth volumes of two sets of contour configurations for the same site, and allows the user to modify, delete or add contours, viewing the site on a graphics terminal. Since most readers of this journal are acquainted with the principles of the technique with respect to landform modelling, this short report will merely describe the main features of the program and will offer some illustrations of the kind of output that can be achieved.

The computer hardware needed to operate the system comprises a high resolution graphics screen, a digitising board and a vector plotter, each being driven in the case of the GlosCAT setup by a Prime mini computer. The software has been written using the PICASO library, which is a comprehensive Fortran-based package of graphics subroutines, and consequently the files are compatible with the other PICASO-based programs developed at GlosCAT, eg DIGIT and CONTOUR (see Landscape Issues 1(1), p23)

The main menu of the program CUT&FILL consists of the following commands:

1. DIGITISE A SITE

From here an original or modified site can be digitised ready for its volume to be calculated. Digitising means the conversion of contour information (analogue) into a series of discrete points to define the line (digital data). Each point has a unique three-figure triplet of x,y and z coordinates, which are generated by pressing the button cursor at appropriate points on the drawing which is attached to the digitising board. It is important to consider the following guidelines when undertaking this activity. Firstly, each contour should be seen as defining a horizontal layer and this may require the digitising of the complete shape by registering points around the edge of the site.

Richard Woods is a programmer/advisor in the Computer Services Unit of GlosCAT with a particular interest in graphics applications for the design disciplines.

Secondly, the height between each successive contour must remain constant, but it is not necessary to enter each contour in height order as they are sorted in the program prior to volume computation. Thirdly, it is recommended that a base outline (frequently a rectangle) is defined of the same height for each set of site contours, to allow correct volume comparisons and this is best located not too far below the lowest point on both sites. Fourthly, digitising should proceed in a clockwise direction round each contour, unless the contour is describing a depression when the process works in the opposite direction. This is to do with the way the computer interprets a given sequence of digits: clockwise-numbered facets are solid ground; anti-clockwise facets may indicate a lake, for example.

2. LOAD A SITE

If a site has already been digitised (from DIGIT) or a suitable set of contours has been generated (from CONTOUR) then this function permits the rapid input of the site data to the program.

3. CALCULATE THE VOLUME

Once the 'original' site has been entered and a second 'modified' site has been digitised separately, or created by modifying the original plan, then this routine validates both sets of contours (sorting and checking for a constant contour interval) and prints a report on site volumes and calculates any difference. This latter figure is then evaluated by the user to gauge the necessary contour manipulation to the modified site pattern in order to satisfy the design criteria. This would normally involve one or more of the following three commands.

4. DELETE A CONTOUR

This will draw a plan view of the modified site and bring up the screen cursors. These are used to mark any contours which are to be deleted. The use of a manual multi-button cursor attached to a digitising pad makes this, and other such modifications, a rapid and efficient operation.

5. MODIFY A CONTOUR

Using this routine points can be moved around a contour, shifting them from one location to another. The plan

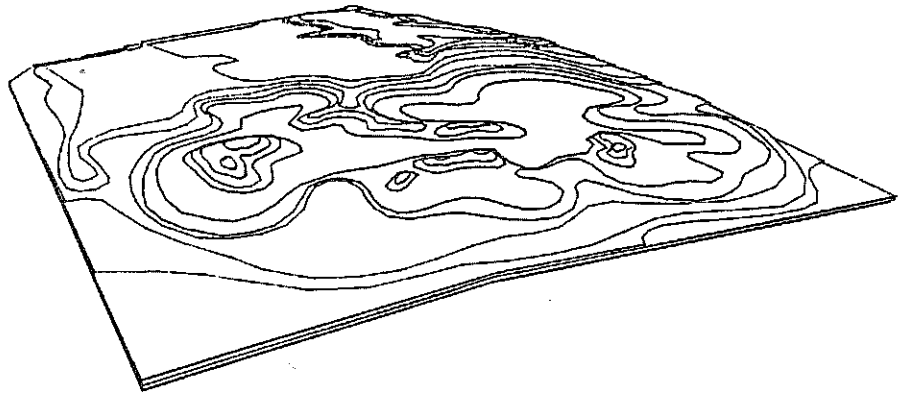


Fig 2 Perspective view of proposed contours

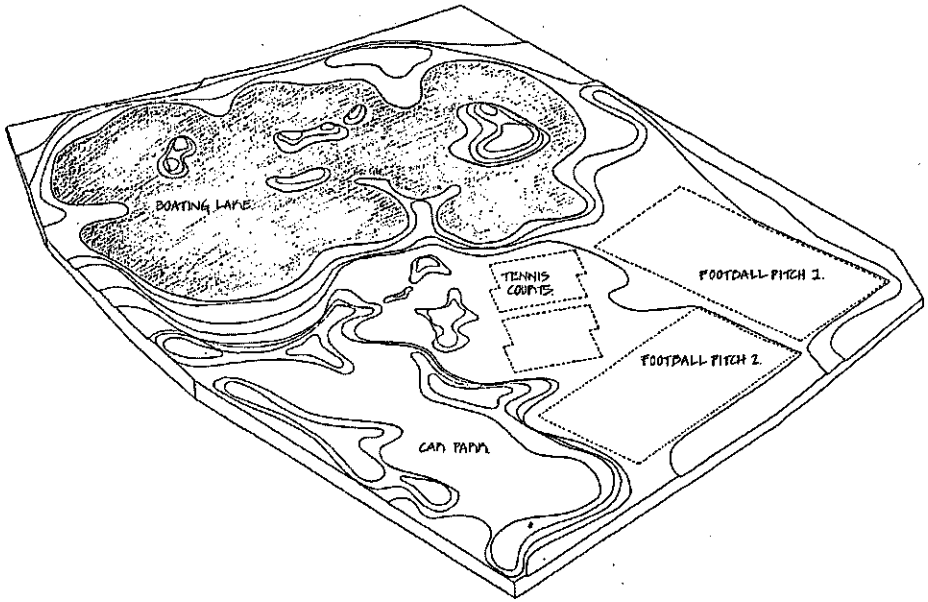


Fig 3 Isometric view with site details added

view is regularly updated so enabling the user to refine the drawing to his satisfaction, unhindered by confusing images of previous patterns.

6. DIGITISE A CONTOUR

New contours of any height can be added to the modified site, perhaps to replace one that has been deleted.

7. SAVE THE SITE

It is normally good practice to save all work done so the data is available for later manipulations. This is achieved by writing files which contain both the existing site contours and any number of modified contour solutions.

8. VIEW THE SITE

Using this routine both sets of contours can be examined on screen: the original site is drawn in dashed lines and the modified site in solid lines, in keeping with the British Standard for landscape drawings (fig 1). Apart from two-dimensional plans, perspective and isometric views are also available to evaluate visual impact (figs 2 and 3). Other topographic features, such as roads, tennis courts, buildings etc, if they have been digitised as a separate file, can also be superimposed on any of the output drawings. Although the plotter installed at GlosCAT is limited to A2 size paper, site plans can be drawn out to any scale even if it means separate printing and physical joining.

Conclusion

Whilst there are some limitations to the program, for example the contours are not labelled nor smoothed, it is expected that landscape architects can use the output as 'rough' drawings, to be traced or enhanced manually. The calculations performed by the computer certainly take the drudgery and inaccuracy out of traditional methods and the facility of three-dimensional viewing as an aid to designing is clearly an advantage. The program has been tested and refined on a number of actual sites and it is hoped that students will now no longer be inhibited from designing more complicated solutions, previously avoided because of the intricate volume calculations frequently involved.

BOOK REVIEW

VICTORIAN FLOWER GARDENS by Andrew Clayton-Payne and Brent Elliott, Weidenfeld and Nicolson, 1988, £12.95

Victorian political science is enjoying popular, though not always critical, attention. It seems that wider interest in things Victorian follows in the wake of headline-catching pronouncements on social and economic matters for a nostalgia for the 'good old days' has been spawned to spill over onto television screens, edge its way into cinemas and of course claim the attention of authors. Gardening too has now been caught up in this gust of popular interest. For a long while Geoffrey Taylor's commentary on the Victorian flower garden graced the shelves in scholarly isolation. Now it has been joined by a number of companions, one of which is the subject of this review.

It was really only at the turn of the century that gardening books became illustrated with photographs. Before that, black and white engravings had to serve the text, but while they could be superbly executed they lost much for not being coloured. When coloured plates did appear the colours were crude and in only the most elementary of ways conveyed the character of the subjects. Compensation for such deficiencies has had to wait for this beautifully produced and imaginatively conceived volume. Beauty is to be found in the accumulated effect of layout, typography, colour reproduction and a host of details, while the concept of annexing contemporary watercolours with up-to-date commentary to describe and analyse typical 'anonymous' and 'undesigned' gardens is clearly out of the ordinary. The Victorian part of the title however is somewhat misleading for, as the authors point out, artists showed little interest in the garden as a subject until the last forty years of the reign and, as if to make good this deficiency, they have included a number of Edwardian examples. This is of course a minor criticism but one might be forgiven for suspecting that this temporal looseness resulted from marketing dictates. A far greater annoyance is the absence of picture dates so limiting comparability and increasing dependence on the judgements made in the text.

It would be tempting to dismiss this as a picture-, or worse, a coffee-table book but this would be doing it much less than justice. Tempting because the water-colours are easy on the eye and as undemanding as any chocolate-box picturesque scene. However, the

accompanying text invites closer observation through a stimulating blend of historical and biographical detail. Thus in spite of the charge that the ubiquitous thatch and timber frame and the flowery foregrounds were nothing more than picturesque indulgences demanded by a complacent and self-indulgent middle-class, close inspection of this selection of one hundred and thirty illustrations provides useful social and horticultural insights that belie any superficial or prejudiced impression.

The humble cottage garden, the virtues of which William Robinson and Gertrude Jekyll extolled, contrasts with the somewhat self-conscious character of the larger country and suburban gardens on which they exerted their influence. Both are filled with hardy annuals and perennials, the former more or less randomly arranged, the latter with a semblance of mannered pretension. Identification of plants is sometimes difficult, especially through Helen Allingham's muddy colours and vague outlines, but where this is so, and generally throughout, the authors come to the rescue with identifications and supporting contemporary written evidence. The botanical detail of Lilian Stannard and Beatrice Parsons, though stunning in itself, is always at the service of broader perceptions — of the place. On the other hand Birket Foster's Pre-Raphaelite brand of truth is less convincing though very beautiful; a case of sanitised rural deprivation.

Each of the six chapters is introduced with an historical outline and a review of some of the contemporary horticultural literature followed by between sixteen and thirty watercolour reproductions often combined with biographical notes on the painters. The formula works well generally though no less than fourteen of Beatrice Parsons' paintings are presented before we are given any biographical details.

The text is packed with information that is of rather greater interest to landscape and garden designers and horticulturalists than painters. For example it is asserted that: 'Whatever the social reality of the cottage garden, the horticultural image had become fixed in the public mind'; that 'annuals and hardy perennials provided half the volume of the nursery trade throughout the Victorian period' and that landowners, 'wanting their estate villages to serve as an advertisement for their taste, insisted on the provision and maintenance of flower gardens' by the cottager. Such topics tend to overshadow, for instance, the significance of the

rivalling Surrey and Cotswold schools of garden painting and thereby the opportunity to make more of the connections with both Gertrude Jekyll and the Arts and Crafts movement.

Doubtless the paintings represent a good range of watercolour skills but collectively they also offer a useful social perspective. For instance it is interesting to note the different types of garden uses depicted. It might be expected that the most common pursuit would be flower picking along with 'gardening' and it would seem to be so but less predictable that these cosy pictures should show baby airing, washing, women reading, children at play and cat feeding. It is also of interest to note a marked gender association, for in no more than four of the illustrated gardens does the adult male appear. Whether depicted as a symbol or as a social reality, woman the home-maker is as soundly associated with the garden as are children in all their beguiling innocence, especially when shown in the company of kittens. Cats, and to some extent dogs, add to this association but a variety of chickens, ducks and geese included in cottage gardens function not so much as accoutrements as, like the vegetable garden, an essential element of the household economy.

The garden designer will perhaps be seduced by the amount of detail that the pictures hold and in particular the variety of garden features and equipment which, when set in a temporal context, tells much of the progress of Victorian gardening. White timber palings with ledged and braced gates are the sine qua non of the cottage garden but a variety of pavings, edgings, steps, ponds, seats, pergolas, hives, well-heads and pumps are also in evidence with sun-dials, fountains and statuary appearing at the turn of the century. Likewise we get a glimpse of the surviving craft technology, of scythes, ladders, besoms, water butts, wheel barrows, trugs, stakes and clay flower pots but the out-pourings of the new industries are nowhere to be seen.

If nothing else the paintings in this book provide useful historical evidence on plant use, evidence that, in the case of the cottage garden, is confirmed elsewhere by the likes of Charlotte Bronte, Elizabeth Gaskell and George Eliot.

Colin Young,
School of Landscape Architecture,
GlosCAT.