Functional Grammar and Genre Analysis: A Description of the Language of Learned and Popular Articles

(Volume 2)

by

John B. Corbett

A Thesis Submitted in Fulfilment of the Degree of Doctor of Philosophy

Department of English Language
University of Glasgow

July, 1992

CONTENTS

VOLUME 1

Appendix A

The Corpus Articles

The corpus is based upon extracts taken from the following articles:

Biology

BP1:
Aronson, R. (1987) "A Murder Mystery from the Mesozoic" New Scientist 8 October, pp 56-59

BL1:
Aronson, R. & Sues, H-D (1987) "The Paleoecological Significance of an Anachronistic Ophiuroid Community" in W. C Kerfoot and A Sih, eds. Predation: Direct and Indirect Impacts on Aquatic Communities Hanover, N.H.: University Press of New England

BP2:
Poulton, J. (1987) "All About Eve" New Scientist, 14 May pp 51-53

BL2:
Cann, R.L., Stoneking, M. & Wilson, A.C. (1987) "Mitochondrial DNA and human evolution" Nature Vol. 325, 1 January pp 31-36

BP3:
Kitchener, A. (1988) "No domestic bliss" Guardian, 7 June

BL3:
French, D.D., Corbett, L.K., & Easterbee, N. (1988) "Morphological discriminants of Scottish wildcats (Felis silvestris), domestic cats (F.catus) and their hybrids" J. Zool. Lond. Vol. 214 pp 235-259

Computing

CP1:
Clark, A. (1987) "Cognitive science meets the biological mind" New Scientist 8 October pp 36-38

CL1:
Clark, A. (No Date) "PDP or not PDP: Is that the Question?" Unpublished MS: University of Sussex

CP2:
Lowe, D. (1987) "Vision leads robots from the factory" New Scientist 10 September pp 50-52

CL2:
Lowe, D. (1987) "The Viewpoint Consistency Constraint" International Journal of Computer Vision Vol. 1 pp 57-72

CP3:
Wilson, G. (1988) "Computing in Parallel" New Scientist 11 February pp 54- 57

CL3:
Forrest, B.M., Roweth, D., Stroud, N. Wallace, D.J. and Wilson, G.V. (1987) "Implementing Neural Network Models on Parallel Computers" The Computer Journal Vol 30, No. 5, pp 413-419

History

HP1:
Walton, J.K. (1985) "The Seaside Resort and its Rise in Victorian and Edwardian England" The Historian pp 16-22

HL1:
Walton, J.K. (1981) "The Demand for Working-Class Seaside Holidays in Victorian England" Economic History Review 2nd Series, 34 pp 249-265

HP2:
Stevenson, D. (1988) "The Bishops' Wars" The Sunday Mail Story of Scotland Vol 2 No. 16 pp 434-437

HL3:
Stevenson, D. (1981) Scottish Covenanters and Irish Confederates Belfast: Ulster Historical Foundation (Chapter One)

HP3:
Bailey, V. (1988) "Crime in the Twentieth Century" History Today Vol. 38, May pp 42-48

HL3:
Bailey, V. (1980) "Crime, Criminal Justice and Authority in England" Bulletin of Society for the Study of Labour History No. 40, Spring pp 36-46

Appendix B

Participants, Processes and Circumstances in Matched Extracts from the Corpus

Field: Biology No.1
Popular article: "A Murder Mystery from the Mesozoic" (BP1)
Learned article: "The Palaeoecological Significance of an Anachronistic Ophiuroid Community" (BL1)

Analogous Passages:

BP1:1 paras 1-4 (Introduction & Persistence of community)

C: Time Actor Pr: mat
In 1885, the Liverpool Marine Biology Committee surveyed the

Range C: Time
waters around the Isle of Man. Reporting on the expedition,

Sayer P: verbal Verbiage
Herbert Chadwick noted that several dredge hauls at Spanish

Head, at the southernmost tip of the island, came up jam-packed

C: Time Actor P:mat
with writhing brittlestars. A century later I rounded on

Range C: Place C: Place [Dir]
Spanish Head in rough seas in a small inflatable boat. It

P: relat Attribute Carrier
had taken more than half an hour to motor out from the

University of Liverpool's Marine Biological Station at Port

Senser P: mental C: Place Phenomenon
Erin. I gazed up at the same forbidding cliffs

that confronted Chadwick the day he pulled up his unusual

\+ C: accompaniment
samples -- and then, with Mike Butler, a postgraduate student,

Actor P: mat C: place Actor P: mat C: place
I rolled over the side. We floated 30 metres down

\+ C: Qual "Actor" P: "mat" C: "place"
through the murk and gradually the seabed came into view.

Actor P: mat Goal C: place
A swift current carried us over an immense carpet of

brittlestars waving their spiny arms in the water.

Carrier P: rel Attribute C: frequ Actor P: mat Range
The sight was astonishing. Normally, we encounter only

the occasional brittlestar hiding under a stone along the

C: place [Dir] P: Ex Existent C: Spatial
shore. Here, there were brittlestars as far as the eye

[Dir] P:relat C: comparison
could see in every direction. It was as if we had

dropped onto some primeval marine community.

C: Time Actor
In the following weeks, Mike Bates, a diving technician at Port

P: mat Ben C: Result
Erin, helped me to map the communities living around Spanish

Actor P: mat Range
Head and Bay Stacka nearby. We found that the population of

the brittlestar Ophiothrix fragilis carpeted half-a-million

C: Frequ
square metres. At more than 600 brittlestars to the square

Carrier P: relat Attribute
metre, the numbers are simply staggering.

Token P: rel Value
The southwestern tip of the Isle of Man is one big

C: "place"
brittlestar bed. From Chadwick's century-old record and

Senser P: mental
studies by a student in the 1960's, we know

Phenomenon
that this bed of Ophiothrix is no fly-by-night community: it is

"Sayer" P: verbal Verbiage
highly persistent. Evidence from fossils suggests that

millions of years ago, similar communities were commonplace

"Sayer"
throughout the oceans of the world. A closer look at today's

P: Verbal Receiv Verbiage
brittlestar beds might tell us why such huge aggregations

thrived in those oceans and what happened to push them into a

few scattered retreats.

BP1:1 (cont.) para 10 (Purpose of research)

Carrier P: rel Attribute
Brittlestar beds are interesting for what they tell us about

Token P: rel Value
the past. They are the modern equivalent of marine

communities that flourished on sand and mud from almost 500

million years ago, in the Palaeozoic Era, until the Cretaceous.

C: Time Token P:rel Value
Beginning 130 million years ago, the Cretaceous was the last

Actor
period of the Mesozoic Era. Epifaunal suspension feeders --

animals such as brittlestars, sea lilies (stalked crinoids) and

lampshells (brachiopods) that lived on top of the sea floor and

P: mat Range
filtered organic particles from the water -- formed dense

C: Temporal [Text]
communities on soft bottoms until the late Mesozoic. Then

Actor C: Quality P: mat C: Place Token
they virtually disappeared from shallow water. Today's

P: rel Value
brittlestar beds are a living link to this ancient type of

community.

BL1:1 paras 1-2 (Introduction & Purpose of research)

C: Time "Range" P: "mat" "Ben"
During the last few years, much attention has been paid to

understanding large-scale shifts in community composition over

Attribute P: rel Carrier
geological time. Of particular interest have been recent

efforts to uncover causal connections between physical events

of global or even galactic magnitude and periodic, catastrophic

C: Reporter
extinctions (Alvarez et al. 1980; Silver and Schultz 1982; Raup

Senser P: men- [modal] C: "spat"
and Sepkoski 1984). The human mind is perhaps so

-tal Phenomenon C: reason
fascinated by the phenomenon of mass extinction because of the

Range
death-drama that it connotes. The intellectual attraction to

P: mat- C:"spatial"-erial Actor
extinction is amply reflected by numerous articles and

two recent symposium volumes dealing soley with that subject

C: Reporter
(Silver and Schultz 1982; Nitecki 1984).

Attribute
Equally interesting to both neontologists and paleontologists

P: rel Carrier
are the dynamics of biotic interactions that caused global-

C: Concession
scale community reorganizations. Although predation may not

occupy the elevated position of a cause for mass extinction

[Dir] P: rel C: Time Attribute Carrier
(Stanley 1984), it is now apparent that predator

activity was of great importance at least one biotic upheaval,

C: Reporter C: Place
the "Mesozoic marine revolution" (Vermeij 1977). In this

Senser P: mental Phenomenon
chapter, we hope to demonstrate how general ideas of

predation may be used to interpret the structure of an extant

ophiuroid-dominated community in a Bahamian saltwater lake.

Goal P- [Text] -mat C: Purpose
Results from this living community are then used to formulate

testable hypotheses concerning the structure of similar fossil

Sayer P:verb- C: Quality -al
assemblages. Williamson (1982) has virtually dismissed

Target Verbiage
paleoecology as "a poor-man's applied ecology performed on

[Text] Actor C: Concession
inadequate data." Yet the fossil record, despite its

P: mat Range
inherent limitations, provides the only direct evidence for

Actor P: "mat" Range
patterns of biotic change through time. We take the

more constructive view of Peterson (1984) that paleoecology

and ecology reciprocally illuminate each other and should be

used in tandem to achieve a broad understanding of community

evolution during the Phanerozoic.

BL1:1 (cont.) para 25 (Persistence of community)

C: Place [Dir] P: rel Attribute Carrier
Where information is available, it is clear that

extant ophiuroid communities have persisted for long periods of

Token
time, ecologically speaking. The Sweetings Pond *Ophiothrix*

P: rel Value C: Temporal
oerstedii community has been qualitatively the same for more

C: Reporter + Phenomenon
than 10 years (Aranson and Harms 1985), and dense beds of *O.*

P: mental C: Place C: Temporal
fragilis have been known from the British Isles since before

Verbiage P: verbal C: Matter [Text]
1900. The same can be said for the fossil communities. Hence,

Token P: rel Value
these dense assemblages of ophiuroids are not examples of

"explosive opportunism" (*sensu* Levinton 1970) but rather

Token P: re; Value
represent stable populations. Only one case conforms to

Sayer P: verbal Verbiage
Levinton's model. Kesling (1969) has postulated that the dense

community of Eugasterella thorni from the Mid-Devonian Arkona shale (table 23.1) was short-lived and fed on a previously destroyed crinoid "garden" along with other scavengers.

BL1:1 (con.) para 12 (Purpose of research)

C: condition Actor P: mat Range
Under certain rare circumstances, we find modern

Carrier
analogues to ancient community types. Such anachronistic

P:rel Attribute
communities of organisms can be strongly reminiscent of fossil "pre-Modern" assemblages in trophic patterns, relative species abundance, and even higher-level taxonomic composition.

Carrier P: rel Attribute
These rare circumstances are crucial to understanding why such assemblages persisted in the geological past.

Token
Stromatolites, which are structures composed of filamentous

P: rel
prokaryotes, trapped sediment, and associated biota, are

Value
a case in point.

Attribute Phenom-
Common in Late Precambrian shallow marine environments, they

P: mental -enon
are thought to have been excluded from most shallow-water habitats by burrowing organisms and grazing mollusks at the

C: Reporter Range
beginning of the Paleozoic (Garret 1970; Knoll 1983). This

P: "mat" Quality C: "Place"
inference is based in part on the fact that Recent stromatolite communities occur in a few supratidal, intertidal, and shallow subtidal settings where harsh physical conditions exclude

C: Reporter
bioturbators and grazers (Garrett 1970; Dravis 1983; Thayer 1983).

BP1:2 para 9 (Location of dense beds of brittlestars)

C: Concession Actor
Although they are rare elsewhere, dense populations of

P: mat
Ophiothrix and another species, Ophiocomina nigra, live

C: Place
all around Britain, from the western Channel to the Shetland

Actor P: mat Range C: Place
Isles. Divers encounter them in South Wales, the Clyde Sea

Possessor
and the east coast of Scotland. Brendan Keegan, a marine

P: rel Possessed
biologist at University College Galway, has a team studying

Actor C: Quality P: mat
them around Ireland. The Manx fishermen studiously avoid

Range C: Reason
heavily populated areas such as Spanish Head, lest their nets

come up full of "limbs", or even tear under the weight of

[Dir] P: Ex [Text] Existent C: Place
brittlestars. There are also brittlestar beds in the

[Modal] Senser P: mental Phenomenon
Mediterranean. Strangely, I know of only two North

Carrier
American populations, both off the coast of California. A few

P: rel Attribute C: Place + Carrier P: rel
other beds are scattered about the world, but they are

Attribute C: Place
most common in Britain's coastal waters.

BL1: from para 19 (Location of dense beds of brittlestars)

Token P: rel
...Population densities in the autochthonous assemblages can be

Value Sayer P: verbal Target
very high. Kesling and Le Vasseur (1971) estimated original

population densities for the Early Mississippian *Strataster*

Verbiage C: Place
ohioensis at 4,500 individuals per square meter at a water

Sayer P: verbal Target
depth of approximately 30m. Liddell (1975) reports densities

Verbiage
for the Middle Ordovician *Stenaster salteri* greater than 440

C: Place
individuals per square meter. Among recent epifaunal

Token P: rel Value
ophiuroids, densities in some populations are comparable.

Actor P: mat Range
Warner (1971) studied an aggregation of *Ophiothrix fragilis* off

the English coast with a mean density of 1,300 individuals per

Actor P: mat Range
square meter (water depth: 14m); Vevers (1952) counted about

340 individuals of this species per square meter at a depth of

Actor P: mat C: Frequency
48 m near Plymouth. *Ophiocomina nigra* occurs at up to 500

C: Place C: Place
individuals per square meter in the Irish Sea at 10 to 30m

C: Reporter Verbiage P: verbal
depth (Brun 1972). Even higher ophiuroid densities have been

C: Place Sayer
recorded off the British Isles by Keegan and Konnecker (1980).

Token
The highest mean density of *Ophiothrix oerstedii* recorded in

P: rel Value C: Report
Sweetings Pond was 434 individuals per square meter (Aronson

and Harms 1985).

BP1:3 para 13 (What ecological studies does)

Sayer P: verbal Receiv Verbiage
Ecological studies tell us under what conditions

Senser P: mental Phenomenon
brittlestar beds persist today. We can look at fossils

C: Purpose
to see how and when the number of brittlestar beds changed in

C: Means Actor P: "mat"
geological time. By combining this information, we gain

Range
an idea of how important mass extinctions and predation were in

[Text] Senser P: mental
the distant past. That is, we can begin to work out

Phenomenon
what really happened to the suspension feeders after the

Actor P- C: Quality -material C: Place
Jurassic. Crinoid gardens have completely disappeared from

+ Actor P: mat C: Place
shallow water, but brittlestar beds remain off the coast of

Token P: rel Value
Britain. The vast swathes of ophiuroids are ecological

anachronisms within the reach of experimental field biologists.

BL1:3 para 29 (What ecological studies does)
(Cf also BL1: para 2 above)

Actor P: mat Range
We have shown how extant anachronistic communities can be

Token
used to make paleoecological inferences. Saltwater lakes and

P: rel Value
other islands are promising places to look for such

Possessor P: rel Possessed
communities. The Bahama Islands contain a vast number of lakes

+ Carrier P: rel
of various degrees of salinity, and most of them remain

Attribute Carrier P: rel
unexplored. Great Oyster Pond, another lake on Eleuthera, is

Attribute C: Comparison Actor
depauperate of fish, like Sweetings Pond. This body of water

P: mat Range
supports high densities of the epifaunal bivalve Pinctada

[Text] Range P: mat
radiata. In addition, a small apodid holothurian was found

C: Quality C: Place C: Time C: Reporter
in great numbers on open substrate during the day (Aronson,

Verbiage
personal observation). Release of benthic organisms due to the

P: verbal C: Quality C: Matter
absence of predatory fishes has been noted anectodally for the

C: Reporter
saltwater lakes of Palau, Micronesia (Hamner 1982; personal

communication).

BP1:4 para 15 & 16 (Requirements for brittlestar survival)

Value P: rel Token
A second requirement for brittlestar beds is that the water

C: Condition
must be relatively free of churned-up sediment. If silt clogs

Actor P: mat
up their tube feet the brittlstars cannot feed.

Actor P: mat
The flow of water and the amount of sediment in it provide

Range [Text]
clues to where brittlestar beds will or will not be. Yet

Goal P: mat Actor
many rocky reefs are swept by good currents carrying plenty of

\+ P: rel Possessed Value
food and little silt -- but have no brittlestar beds. The

P: rel
third key requirement for a dense blanket of ophiuroids is

Token
that predation pressure should be low.

BL1:4 para 18 (Requirements for brittlestar survival)

C: Place Token P: rel Value
In the North Sea, burial and smothering is the leading

C: Reporter Sayer P: verb
cause of death for ophiuroids (Schafer 1962). Schafer noted

Vebiage
that only 5cm of sediment is required to trap and prevent the

Actor
upward escape of these animals. Fine-grained sedimentary

[Modal] P: mat Goal
matter presumably obstructs the function of the water vascular

C: Reporter Range
system in ophiuroids (Rosenkranz 1971). Areas of rapid

P:- [Text] material Actor
sedimentation are therefore avoided. Kesling (1969),

P: mat
Rosenkranz (1971) and Goldring and Stephenson (1972) have

Range
analyzed fossil examples of autochthonous thanatocoenoses of

asterozoans due to rapid smothering by muddy sediment.

Range P:- C: Frequ -mat C: Place
Articulated ophiuroids are usually found in fine-grained

C: Accompaniment
Paleozoic and Mesozoic sediments, often with some clay content

P: ment Phenomenon C: Place
(see review in Rosenkranz 1971).

BL1:4 (cont.) para 20 (Requirements for survival)

Sayer P: verbal Verbiage
Aronson and Harms (1985) have suggested that the formation of

dense assemblages of brittlestars (and other epifaunal

suspension feeders) may be related to low predation pressures.

Actor P: mat Range
We found only one example of a post-Jurassic dense

assemblage of articulated ophiuroids: Allman (1863) described

an aggregation of Ophiolepis gracilis from the Brick Clay near
C:
Dunbar, East Lothian, apparently a late glacial deposit (Baird,

Reporter
personal communication).

BP1:5 paras 17-21 (Modern predators, measuring predation, results of experiments)

Actor P: mat Goal
Cod, flatfish. wrasses, dragonets and crabs eat ophiuroids

Phenomenon
on rocky reefs. These modern predators -- modern, geologically

P:- C: Freq -ment C: Place
speaking -- are rarely seen off Spanish Head and Bay Stacka.

C: Place Token P: rel Value
There, slow-moving starfish are the biggest threat to

C: Comparison Actor
brittlestars. Like their brittlestar cousins, starfish

P: mat C: Time Token P: rel Value
appeared early in the Palaeozoic. They might have been the
C: Place
chief predators in ancient brittlestar communities.

C: Purpose Actor P: mat Goal
To measure predation directly, I tied Ophiothrix

C: Place + P:- Goal -mat C: Role C: Place
to small weights and set them out as "bait" at Bay Stacka.

C: Purpose Actor P: mat Range C: Place
For comparison, I did the same experiment on a rocky

C: Place Carrier P: rel
reef just outside Port Erin Bay. Here brittlestars are

Attribute + Actor P: mat Range C: Place
much more sparse and we find them only under rocks and

in crevices.

Actor P: mat C: Place Actor P: mat Goal
Nothing much happened at Bay Stacka. Starfish consumed bits of

+ Actor P: mat
a few tethered brittlestars, but most of them survived. At

C: Place [Text] Actor P:mat
Port Erin, on the other hand, ballan wrasses and flatfish ate

Goal Actor P: mat Range
most of the experimental animals. I repeated the

C: Place
experiment at the Millport Marine Station, on the Isle of

Actor P: mat Range C: Place
Cumbrae. Ophiocomina nigra forms a dense bed in 10 metres of

Token P: rel
water, just offshore of the laboratory. The results were

Value
identical: predation pressure is low in brittlestar beds.

Carrier P: rel Attribute C: Condition
The predation argument would be even more convincing if it also

C: Comparison [Dir] P: ex
applied elsewhere in the world. As it turns out, there is

Existent C: Place Token P:rel
one dense population of ophiuroids in the Bahamas. This is

Value
another species of Ophiothrix, living in Sweetings Pond, a

Carr P:rel
large saltwater lake on Eleuthera Island. Sweetings Pond is

Attrib + Carrier P: rel
cut off from the Caribbean Sea, and Ophiothrix oerstedii are

Attrib C: Place C: Comparison
100 times more abundant there than they are off the

C: Comparison Actor P: mat
Eleuthera coast. As in the British beds, the animals cover

Range + P: mat Goal C: Purpose
the bottom and hold up their arms to capture suspended food

[Dir] P: rel [Modal] Value Token
particles. It is surely more than a coincidence that

there are no reef fish that eat brittlestars in this lake.

C: Frequ Possessor P: rel Possessed
Once again, the main predators have impeccable Palaeozoic

pedigrees: they are a sandworm and a species of brittlestar

that hunts bottom-dwelling invertebrates (not all ophiuroids

C: Place
are suspension-feeders). Along the coast, where fish are

Carrier P: rel Attrib Actor P: mat C:
abundant, Ophothrix is rare. The brittlestars live under

Place
coral rubble and inside tube sponges.

Actor P: mat
The results of predation experiments in the Caribbean mirrored

Range Actor P: mat
those of the British study. Wrasses and other reef fish ate

Goal
virtually all tethered brittlestars in the Bahamas, the Virgin

[Text] Actor P: mat C:
Islands and Belize. In stark contrast, they all survived in

Place [Text] Token P: rel C: Freq Value
Sweetings Pond. So predation is again an important

Sayer [Text] P: verbal
clue to the abundance of brittlestars. It also explains

Verbiage C: Place
why they behave differently at different sites. Where there

Actor P: "mat" Range C:
are predators about, brittlestars must spend their lives in

Quality
hiding, coming out to feed only at night.

BL1:5 para 13 (Modern predators, measuring predation, results of experiments)

Possessor
Sweetings Pond, an isolated saltwater lake on Eleuthera Island,

P: rel Possessed
Bahamas, contains another type of anachronistic community.

Actor P: mat Range
This lake supports a persistent, high density population of the

epifaunal, suspension-feeding ophiuroid Ophiothrix oerstedi.

Token
The ophiuroid density, which sometimes exceeds 400 individuals

P: rel Value
per square meter (figs. 23.1A and 23.2) is two orders of

C: Comparison +
magnitude higher than that found in nearby coastal habitats and

P: mat C: Reason
occurs because predatory fishes are virtually absent from the

C: Reporter C: Time
lake (Aronson and Harms 1985). When assemblages of ophiuroids

comparable in density to those in Sweetings Pond were exposed

in open arenas (from which they could not escape) at a coastal

Goal P: mat C: Quality P: mat
site off Eleuthera, the brittlestars were completely consumed

C: Temporal Actor P: mat
within 48 hours. No significant ophiuroid mortality occurred

C: Place Sayer
in similar arenas in the lake. Gut content and fecal analyses

of all possible Sweetings Pond predators of Ophiothrix,

P: verbal
including the large majid crab Mithrax spinosissimus, confirmed

Verbiage C: Means
the virtual absence of predation. Through observation and

Actor P: mat Range
experimentation, Aronson and Harms (1985) demonstrated that

density variations within the lake are determined by variations

in the degree of small-scale topographical heterogeneity, not

C: Contrast
by variation in predation pressure. In stark contrast to

Actor P: mat
coastal conspecifics, Sweetings Pond brittlestars expose

Goal C: Time Token P: rel
themselves day and night. This behavioral difference is

Value
causally related to the difference in predatory activity by

C: Reporter
fishes (Aronson 1985).

BP1:6 para 22 (Ancient predator)

Value P: rel Token Actor
The top carnivores in Sweetings Pond are octopuses. They

P: mat Goal
eat the small crustaceans and clams that live in the lake

+ P: mat Goal Attrib Token P:rel Value
but leave brittlestars alone. Octopuses are relatives of

the shelled cephalopods, *Nautilus*, for example, that were

important predators before the Mesozoic marine revolution.

"Actor" P: "mat" Range
A cephalopod at the top of the food chain makes the analogy

between Sweetings Pond and ancient communities of suspension-

Attrib
feeders all the more plausible.

BL1:6 para 11 (Ancient predator)

Token P: rel Value
Cephalopods with external shells (ectocochliates) were common

[Modal]
carnivores in Paleozoic and Mesozoic marine ecosystems. In

Actor P: mat Range
fact, nautiloids and ammonoids may have contributed predation

C: Reporter
pressure to the mid-Paleozoic "pre-revolution (Signor and Brett

Actor P: mat
1984). Crop contents of Jurassic ammonites contained

Range
foraminiferans, ostracods, smaller ammonites and small

comatulid crinoids but no remains of larger mobile animals

C: Reporter C: Time Token
(Lehmann and Weitschat 1973). Today, the deep-dwelling

P: rel Value Token P: rel
Nautilus is the only remaining ectocochliate; it is

Value
both a scavenger and a predator, feeding on crustaceans and

C: Reporter Target
fishes (Lehmann and Weitschat 1973). The increased development

of coarse ornamentation on ammonoid shells, especially by

P: verb Sayer Verbiage
Cretaceous times, is interpreted by Ward (1981) as the result

of increased activity by durophagous predators, especially

Actor P: mat C: Quality C: Temporal
crustaceans. The ammonoids decreased in diversity for millions

of years preceding their sudden extinction at the Cretaceous-

Actor
Tertiary boundary. Both global-scale physical disruptions

(Alvarez et al. 1984) and the activities of durophagous

P: "mat"
predators (including invertebrates; Ward 1983) may have

Beneficiary
contributed to this gradual decline.

BL1: 6 (cont.) paras 14-16 (Ancient predator)

Value P: rel
Another aspect of the lake's anachronistic character is

Token
its high density of Octopus briareus, the Caribbean reef

Token P:rel [Text]
octopus. The population density of this cephalopod is also

Value
orders of magnitude greater in Sweetings Pond than off the

C: Frequ Carrier P: rel
coast. Once again, the absence of predatory fishes appears to

Attrib Goal P: mat Actor
be responsible. The octopuses are limited by the availability

C: Reporter
of dens in Sweetings Pond (Aronson, in press).

[Dir] P:rel [Modal] Attribute Carrier
It is perhaps more than coincidental that a slow-moving,

epifaunal, suspension-feeding echinoderm, which carpets

portions of the lake substrate and gives the benthos a

distinctly Paleozoic appearance, is accompanied by a cephalopod

(which does not feed upon ophiuroids; Aronson and Harms 1985).

Carrier P: rel Attrib C: Place
Ectocochliate cephalopod carnivores were common in Paleozoic

P:ment Phenom +
and Mesozoic coastal benthic communities (see Discussion), and

Actor P: mat Range C:Accomp
they may have exerted a relatively greater influence (in the

C: Comparison
absence of teleosts) than do the present-day coleoids.

[Text] Token P: rel
Therefore, the abundant octopuses in Sweetings Pond may be

Value
functional analogues of ammonoids and/or nautiloids in

Actor
Paleozoic marine communities. The observations in Sweetings

P: mat Range
Pond support the hypothesis that increased fish predation in

the Mesozoic contributed to the demise of dense ophiuroid as

C: Place
well as crinoid communities in coastal habitats. Where

predation pressure from fishes (and crustaceans) is weak or

absent, as in Sweetings Pond and some temperate and boreal

Actor C: Time P: mat C: Qual
coastal communities, exposed ophiuroids still occur densely

C: Reporter
(Vevers 1952; Warner 1971; Wilson et al. 1977; Aronson and

[Modal] Range
Harms 1985). In fact, fluctuations in the occurrence of dense

beds of *Ophiothrix fragilis* in the English Channel over a

P: mat C: Accompaniment
period of several decades have been correlated with changes in

predation pressure exerted by two species of the starfish *Ludia*

Reporter C: Place Senser P: mental Phenom
(Holme 1984). In the next section, we shall review the

\+ P: mat Range
fossil record of ophiuroids and attempt to address the

following questions: (1) Was there a decline in the occurrence

of dense ophiuroid assemblages in the fossil record after the

Mesozoic marine revolution? (2) Is there evidence that

predation pressure on dense populations of fossil ophiuroids

was limited or absent?

BL1:6 (cont.) para 28 (Ancient predator)

[Dir] P: rel Attrib Carrier
It is not unreasonable to imagine that cephalopods were

common predators in some ancient ophiuroid-dominated

Carrier
communities, as they are in Sweetings Pond. Ectocochliates and

P: rel [Modal] Attribute C: Place
coleoids are certainly common in the Late Jurassic

C: Reporter
deposits at Solnhofen (Kuhn 1963) and La Voulte-sur-Rhone

C: Reporter C: Reason
(Dietl and Mundlos 1972). Based on data from Sweetings Pond,

Senser P: ment Phenomenon
we suspect that many cephalopods in Paleozoic and Mesozoic

communities did not consume brittlestars, even when the latter

C: Concession Value
were extremely abundant. To our knowledge, the only living

P: rel Token
cephalopod that preys on ophiuroids is the deep-dwelling

C: Reporter C: Accomp
Bathypolypus arcticus (O'Dor and MacAlaster 1983). In the

[Text]
absence of fish, crustacean, and cephalopod durophagy, then,

Actor P: mat C: Place
dense populations of ophiuroids could thrive in "Paleozoic"

communities.

BP1:7 para 23 (What happens if predation increases?)

[Text] P: mat Goal C: Condition
What happens to brittlestar beds if predation increases?

Actor P: mat C:
Many beds in the western English Channel have disappeared since

Temporal Actor
1970. Norman Holme of the Marine Biological Association in

P: "mat" Range C: "Place"
Plymouth links this decline to recent increases in the

C: Comparison
population of a predatory starfish. Like the brittlestar bed

Actor P: mat C: Quality
off the Isle of Man, these populations had been doing quite

C: Temporal Actor P: "mat"
nicely since the end of the 19th century. Predators tipped

Goal C: Result
the balance, destroying the beds.

BL1:7 from para 15 (cf section 7 above)

C: Place
Where predation pressure from fishes (and crustaceans) is weak

or absent, as in Sweetings Pond and some temperate and boreal

Actor C: Time P: mat C: Qual
coastal communities, exposed ophiuroids still occur densely

C: Reporter
(Vevers 1952; Warner 1971; Wilson et al. 1977; Aronson and

[Modal] Range
Harms 1985). In fact, fluctuations in the occurrence of dense

beds of Ophiothrix fragilis in the English Channel over a

P: mat C: Accompaniment
period of several decades have been correlated with changes in

predation pressure exerted by two species of the starfish Ludia

C: Reporter
(Holme 1984)

BP1:8 para 27 (Response to question: has predation increased?: injuries to brittlestars compared)

Actor P: mat Goal
I compared injuries to two populations of brittlestars that

Actor
lived in warm seas more than 190 million years apart. Not one

P: mat
brittlestar in a Jurassic population from Dorset was

Goal [Text] Possessor
regenerating an arm. In contrast, 70 per cent of a closely

P: rel Possessed
related living species from Belize had at least one injured

Token P: rel Value + Actor [Modal]
arm. This is a big difference, and it certainly

P: mat Range
supports the notion that predation increased after the

Senser P: ment Phenomenon
Jurassic. Palaeontologists have looked at injuries in several

other communities of ophiuroids that lived before the

Token P: rel
Cretaceous. The highest level of injury they have found is

Value
2 per cent.

BL1:8 paras 21-24 (Response to question: has predation increased?: injuries to brittlestars compared)

C: Place
From the Early Devonian Hunsruck shales in southwestern

Actor P: mat Range
Germany, Lehmann studied more than 1000 well-preserved

Actor
ophiuroids, referable to 15 genera and 22 species. Only 23

P: mat Range C: Place
specimens showed regeneration of arms or of arm tips in this

C: Reporter Carrier P: rel Attribute
large sample (Lehmann 1951). This is consistent with

the hypothesis that predation pressures on Paleozoic ophiuroid

C: Concession
populations were low. With the possible exception of a large

[Dir] P: ex Existent C: Place
placoderm fish, there are no potential predators in the well-

preserved associated arthropod and fish faunas from the

Actor P: mat Range
Hunsruck shales. The shales differ from other, more locally

C: Quality
restricted occurrences of Paleozoic ophiuroids in that they

C: Reporter
were probably formed in the upper bathyal region (Seilacher and

Token
Hemleben 1966). The formation of this unusually rich and

P: rel [Modal] Value
diversified assemblage of marine fossils was possibly the

result of intermittent poisoning of the bottom water layers

C: Reason
because at other times conditions for life (as indicated by

trace fossils) were favorable.

Actor P: mat Range
Kesling and Le Vasseur (1971) found no evidence of predation,

either in the form of regenerating arms or preserved predators,

C: Place [Dir] Sayer
in their dense Strataster aggregation (fig. 23.1B). They

P: verb Verbiage
estimate that this Strataster community persisted for at least

30 years.

C: Place Carrier
Among the Mesozoic occurrences, that of the Late Jurassic

P: rel Attribute
Solnhofen lithographic limestones in Bavaria is of

Actor P: mat C: Place
particular interest. These deposits formed in lagoonal basins

C: Reporter
between geographically older sponge reefs (Hemleben 1977). The

Carrier P:rel
small ophiuroids Geocoma carinata and Ophiurella speciosa are

Attribute C: Place C: Reporter Possessor
extremely abundant at Zandt (Kuhn 1963). The associated fauna

P: rel Possessed C: Accomp
contains a moderate radiation of small teleosts, along with

numerous holostean fishes and numerous ammonoid and coleoid

Senser P: ment Phenomenon
cephalopods. We know of no published details concerning

predation on the ophiuroids.

Actor
Of 55 well-preserved specimens of Ophiomusium weymouthiense

from the Late Mid-Jurassic of Weymouth, Dorset, housed in the
collections of the British Museum (Natural History), only one
P: mat Range C: Reporter
showed arm regeneration (Aronson, personal observation).

BP1:9 para 28 (Conclusions)

[Text] [Dir] P: ment Phenomenon
So it appears that ancient brittlestar beds and crinoid
gardens were severely affected when new, more efficient
C: Time Actor
predators appeared in the Cretaceous. Today, epifaunal
P: mat C: Place Value
brittlestar beds survive only where predation is low. The next
P: rel Token
step will be to explain why dense populations are so common
around the British Isles yet so rare in North America and
elsewhere.

BL1:9 para 26 (Conclusions)

C: Concession
Even though direct evidence concerning the level of predation
pressure on dense populations of fossil ophiuroids is scanty,
Actor
the temporal distribution of these communities and the data on
P: mat Range
predation in some extant assemblages support our hypothesis
that dense communities of epifaunal brittlestars were largely
[Style]
excluded from shallow water after the Mesozoic. In particular,
Senser P: ment Phenomenon
we see a relation between the explosive Cretaceous

radiation of teleostean fishes and the virtual disappearance of
dense assemblages of fossil ophiuroids in the Cretaceous.

Value
Dense extant assemblages on soft substrates in shallow-water

P:- C: Frequ -rel Token P: ment
settings are frequently composed of infaunal species (see

Phenomenon Carrier P: rel Attribute
Thorson 1957). Exposed epifaunal brittlestars are more

C: Comparison + Actor P: mat
characteristic of deep than of coastal waters, and they can

Goal C: Reporter
dominate the macrofaunas of deep-sea communities (Barham et al
1967; Rowe 1971; Grassle et al 1975; Tyler 1980).

BL1:9 (cont.) para 30 (Conclusions)

Possessor P: rel
The study of ecological release in saltwater lakes has

Possessed Actor
practical application. Information culled from Sweetings Pond

P: mat Ben C: Range
and other lakes may enable us to predict the biotic
consequences of large-scale overfishing in shallow-water marine

Token
habitats. The high abundance of <u>Octopus</u> in a back-reef

P: rel Value
community on the north coast of Jamaica may be related to the

C: Reporter
severe overexploitation of local fish resources (Aronson, in

Sayer P: verb Verbiage
press). We recommend that overfished habitats be examined
to ascertain whether the removal of predatory teleosts is
increasing the abundance of epifaunal suspension-feeders and
therefore is perhaps driving those communities toward
anachronistic faunal compositions.

Field: Biology No. 2
Popular article: "All About Eve" (BP2)
Learned article: "Mitochondrial DNA and Human Evolution" (BL2)

Analogous Passages

BP2:1 paras 1-3 (Introduction)

[Text] Sayer P: Verb Target Verbiage C: Reason
"And Adam called his wife's name Eve; because she was

C: Reporter Actor P: "mat" Goal
the mother of all living" (Genesis 3, 20). Eve hit the papers

C: Time
in the first week of 1987, following an article in Nature which

suggested that a common maternal ancestor of all living humans

Verbiage
had lived 200 000 years ago in Africa. " 'Super Eve' must have

P: verb Sayer [Text]
lived in East Africa," said the Daily Telegraph. What

P: rel Token [Modal] [Text]
is the story really about?

Actor
Rebecca Cann, Mark Stoneking and Allan Wilson, of the

P: mat Range
University of California at Berkeley, present evidence for

+
evolutionary relationships between different racial groups and

[Text] P: verb Verbiage
then estimate the date of the point at which these lineages

Token P: rel
diverge. The common ancestor of all the lineages may represent

Value
one woman living at that time, "Eve".

Carrier P: rel Attrib
Studies of evolution have become increasingly powerful and

Actor C: Quality
verifiable. Investigations of protein structure rapidly

P: mat Range
superseded simple morphological comparisons of species that

[Text]
looked at the form and structure of whole organisms. For

Actor
example, two proteins that apparently carry out the same role

P: mat C: Quality
in two different types of organism may vary widely

C: "Place"
in their chemical composition: the detailed protein structure

Actor P: mat
belies the superficial resemblance. This kind of data enables

Range C: Result
researchers to reconstruct the order in which species diverged

[Text] Sayer
during evolution. For example, the immunological properties of

P: verb Verbiage
albumen, a protein found in blood plasma, suggest that humans

are as closely related to chimpanzees and gorillas as these

C: Time Actor
apes are to each other. More recently, comparisons based on

P: mat Range
the analysis of DNA have provided more detail than either

morphology or identifying the order of amino acids in proteins.

Actor P: mat Range
Researchers studying protein structure determine the sequence

Actor P: mat Goal
of its amino acids. The genetic code links this sequence

C: Place
to the order of bases in DNA: a triplet of bases forms a code-

\+ Carrier
word that specifies a particular amino acid. But this code

P: rel Attribute C: Reason
is "redundant", in that several different triplets specify

Actor P: mat Range
the same amino acid. A mutation in one base might leave the

Attribute [Text] Actor
protein's structure unchanged. So analysis of the DNA

P: mat Range
gives the most precise view of the evolutionary relationships

between individuals.

BP2:1 (cont.) para 15 (Typical mammalian females)

[Text] Goal P: mat C: Means
Finally, the hypothesis should be qualified by a re-examination

Attribute P: rel
of the assumptions inherent in the method. How valid is

Carrier
the statement "typical mammalian females...behave as haploids",

that is, as though they possess a single set of unpaired

chromosomes, as far as their mitochondria are concerned?

C: Concession
Although recombination between mitochondrial genomes has never

Actor P: mat Range
been demonstrated, recent studies in cows have shown that a few

[Text] Possessor
are "heteroplasmic" or "mosaics". In other words, an

P: rel Possessed
individual cow may contain a 50:50 mix (or some other

proportion) of two mitochondrial genotypes, rather than just

[Text] P:- Actor
one genotype. How does a new mitochondrial mutation

- mat C: Place P:mental Phenomenon
become established in an individual? Suppose a single

variation occurred in one mitochondrial genome out of the

[Text] P:- Actor
thousands of others in each cell; how could this mutated

P: mat Goal C: Condition
genome alone populate the embryo against the competition from

Value P: rel Token
the others? The simplest explanation is that some kind of

C: Result
bottleneck exists so that only a tiny proportion of the

mitochondria in the ovum contribute to the embryo's

[Text] Token P: rel
mitochondrial genotype. Alternatively, the individual might be

Value
a mosaic with two mitochondrial types existing in equilibrium.

C: Condition [Text] Carrier P: rel Attrib + Actor
If this is so, then it is extremely rare, and one or

C: Quality P:mat C: Cond
other mitochondrial population rapidly takes over. If then,

there are individuals whose mitochondrial lineage is

effectively diploid, with contributions from two mitochondria,

P: rel Token Value [Text]
is a mutation the only possible source of variation? What

Token
about a rare paternal contribution or some kind of

Actor P: "mat" Goal
recombination event? Any of these would complicate the idea

that individuals are haploid for their mitochondrial genotype.

BL2:1 paras 1-2 (Introduction/Typical mammalian females)

Token P: rel C: Time Value
Molecular biology is now a major source of

quantitative and objective information about the evolutionary

Actor P:mat Range
history of the human species. It has provided new insights

C: "Place"
into our genetic divergence from apes[1-8], and into the way in

Carrier
which humans are related to one another genetically[9-14]. Our

P: rel
picture of genetic evolution within the human species is

Attrib [Text] C: Reason
clouded, however, because it is based mainly on comparisons of

Actor P: mat C: Qual C: Place
genes in the nucleus. Mutations accumulate slowly in nuclear

[Text] Range P: mat C: "Place"
genes. In addition, nuclear genes are inherited from both

\+ P: mat C: "Place" Actor P: mat
parents and mix in every generation. This mixing obscures

Goal + P: mat Range
the history of individuals and allows recombination to occur.

Actor P: mat [Dir] Attribute Range
Recombination makes it hard to trace the history of

C: Condition
particular segments of DNA unless tightly linked sites within

them are considered.

Actor P: mat Ben
Our world-wide survey of mitochondrial DNA (mtDNA) adds to

C: Means
knowledge of the history of the huuman gene pool in three ways.

[Text] Actor P: mat Range
First, mtDNA gives a magnified view of the diversity present

C: Reason
in the human gene pool, because mutations accumulate in this

[Text]
DNA several times faster than in the nucleus[15]. Second,

C: Reason
because mtDNA is inherited maternally and does not recombine[16],

Token P: rel Value
it is a tool for relating individuals to one another.

[Text] [Dir] P: ex Existent C: Place
Third, there are about 10^{16} mtDNA molecules within a typical

\+ Carrier P:rel Attrib
human and they are usually identical to one another[17-19].

Behaver [Text] P: beh C: Role
Typical mammalian females consequently behave as haploids,

C: Reason
owing to a bottleneck in the genetically effective size of the

Token
population of mtDNA molecules within each oocyte[20]. This

P: rel Value
maternal and haploid inheritance means that mtDNA is more

sensitive than nuclear DNA to severe reductions in the number

Actor
of individuals in a population of organisms[15]. A pair of

P: mat Range +
breeding individuals can transmit only one type of mtDNA but

P: mat Range
carry four haploid sets of nuclear genes, all of which are

Actor
transmissable to offspring. The fast evolution and peculiar

P: "mat" Range
mode of inheritance of mtDNA provide new perspectives on how,

where and when the human gene pool arose and grew.

BP2:2 paras 4-7 (Assumptions)

Range P: "mat" C: "Place"
This approach is based on one simple assumption: once two lines

separate in evolution, their DNA accumulates different

C: Comparison C: Comp
mutations. The longer the time since this occurred, the more

Actor
the differences that accumulate. Only a small proportion of

[Modal] P: mat C: Behalf
the DNA in the nucleus of a cell actually codes for protein

Actor P: mat Range C:Comp
sequences. The non-coding regions accumulate mutations much

[Modal] C: Reason
faster than the coding regions, presumably because the majority

of mutations in these regions will be detrimental to the

Actor [Text] P: mat C:
organism and its progeny. Selection, therefore, operates, so

Result
that probably only a small proportion of the mutations that

Target
occur in the coding regions stay in the population. The

presence, in a population, of two (or more) variants of a gene

P: verbal
-- one for blue eyes or brown eyes, for example -- is called

Verbiage C: Means
polymorphism. By comparing DNA polymorphisms established in

Actor P: mat
different populations, evolutionary geneticists can estimate

Range Sayer
the extent of the divergence between those populations. Small

differences between corresponding regions of DNA in two groups

P: verb Verbiage Sayer
would suggest a close relationship, or recent divergence: large

P: verb Verbiage
differences would suggest that the two groups had been separate

for a long time.

Actor P: mat Range
Cann and her colleagues study mitochondrial DNA, which is

Target
particularly suitable for this type of analysis. Mitochondria

P:- C: Freq -verb Verbiage Token P: rel
are often called the power houses of the cell. They are

Value
organelles, small bodies inside the cell, concerned with an

Token P: rel Value
enormous number of metabolic reactions. These include the

synthesis of compounds, such as ATP, that provide energy for

C: Result
many of the chemical reactions in the cell; hence the

C: Concession
"powerhouse" image. Even though they cannot exist

Possessor P: rel Possessed C: Qual
independently, each mitochondrion contains its own DNA as one

or more copies of a circle of DNA that is 16 569 base pairs

Actor P: mat C: Behalf [Text] Actor
long. Most of this DNA codes for proteins. However, this

P: mat Range
compact piece of DNA encodes only a tiny proportion of the

mitochondrial "machinery": just 13 out of the many hundreds of

mitochondrial proteins.

Maternal bequest

C: "Place" Token
In the vast majority of humans every piece of mitochondrial DNA

P: rel Value Actor P: mat
is identical to every other one. Each individual inherits

Range
the genetic constitution, or genotype, of his or her

C: "Place" Possessor P: rel
mitochondria from the mother: the unfertilised ovum contains

Possessed C: Comparison
between 400 and 200 000 maternal mitochondria, while each sperm

Actor
contains only a time fraction of this number. Experiments

P: mat Range
demonstrate that the father makes no contribution to the

\+ C: Time
ultimate mitochondrial genotype of his offspring, and so far

Verbiage
no examples of recombination between maternal and paternal

P: verb C: "Place"
mitochondrial genomes have been documented in people.

[Text] Actor P: mat C: Freq
Furthermore, mitochondrial DNA mutates much more often --

[Modal] C: Freq C: Comparison
perhaps 10 times faster -- than DNA in the nucleus.

Actor P: mat Goal Attribute
All these factors make mitochondrial DNA helpful in studying

Actor P: mat Range
evolution. Every individual inherits a mitochondrial genome

identical to his or her mother's, bearing a succession of

mutations inherited from individuals in whom they occurred.

C: Condition
Assuming that these inherited changes are neither advantageous

nor deleterious to the individual, and occur at a constant

Actor P: mat C: Role
rate, the rate of acquiring mutations can act as a "genetic

C: Result
clock" to reveal how long ago lineages diverged.

BL2:2 para 11 (Assumptions)

Evolutionary tree

Goal
A tree relating the 133 types of human mtDNA and the reference

[Dir] P:"mat" C: Means C: Purpose
sequence (Fig.3) was built by the parsimony method. To

Actor P: "mat" Range
interpret this tree, we make two assumptions, both of

which have extensive empirical support: (1) a strictly maternal

mode of mtDNA transmission (so that any variant appearing in a

group of lineages must be due to a mutation occurring in the

ancestral lineage and not recombination between maternal and

paternal genomes) and (2) each individual is homogeneous for

Senser P:- [Text] -ment
its multiple mtDNA genomes. We can therefore view

Phenom C: Role
the tree as a genealogy linking maternal lineages in modern

human populations to a common ancestral female (bearing mtDNA type a).

BP2:3 paras 8-10 (Procedure: restriction-mapping)

Actor P: mat C: Accompaniment
Cann and her colleagues started with mitochondrial DNA
extracted from 147 individuals from five geographical regions.

Actor P: mat Goal C: Means
They digested these samples with 12 so-called restriction
Senser P: "ment" Phenomenon
enzymes. Each restriction enzyme recognises a specific short
\+ P:mat Goal C: Place
sequence of bases on the DNA and breaks the DNA at that site.

Value P:rel Token
The result is a collection of fragments of different length.

Goal P: mat C: Quality C: Purpose
These can be sorted out according to length to provide a "map"
C: Condition
of the entire genetic material, the genome. If one site is
[Modal] C: Reason
missing from a mitochondrial genome, perhaps because of a
[Text] Carrier P: rel Attrib
mutation, then the collection of fragments will be different
\+ [Attrib] P: rel Carrier Token
and so will the resulting pattern. Restriction mapping,
P: rel Value
as the technique is called, is an efficient way of
searching out the differences between two samples of DNA.

C: Means Senser P: ment Phen
Looking at the 147 restriction maps, Cann could discern 133
C: Reason
different types, as only a small proportion were exact
C: Means
duplicates. By estimating the extent of divergence among the

Actor [Text] P: mat Range

133 DNA sequences the researchers then plotted a "tree of

Goal P: mat C: Purpose

lineages". This tree is constructed to minimise the total

number of mutations needed to result in the observed diversity.

Goal P: mat C: Place Goal

Closely related DNAs are joined at a peripheral branch, widely

C: Place Possessor P:rel

divergent DNA types near the root of the tree. The tree has

Possessed

two main branches: one representing Africans only, and the

C: "Place" Actor

other all five racial groups. From this information Cann,

P: mat Range

Stoneking and Wilson advance three hypotheses.

BL2:3 paras 4-6 (from extended section on restriction mapping)

Goal P: mat Range

Each purified mtDNA was subjected to high resolution mapping[22-24]

C: Means

with 12 resrtriction enzymes (HpaI, AvaII, FnuDII, HhaI,

HpaII, MboI, TaqI, RsaI, HinfI, HaeIII, AluI and DdeI).

Range P: mat C: Means

Restriction sites were mapped by comparing observed fragment

patterns to those expected from the known human mtDNA

C: Means Actor P:mat Range

sequence[25]. In this way we identified 467 independent

sites, of which 195 were polymorphic (that is, absent in at

Range

least one individual). An average of 370 restriction sites per

P: mat Attrib

individual were surveyed, representing about 9% of the 16,569

base-pair human mtDNA genome.

Map comparisons

Carrier P: rel Attribute
The 147 mtDNAs mapped were divisable into 133 distinct types.

Range P: mat C: Place
Seven of these types were found in more than one individual;

Possessor P: rel Possessed Actor
no individual contained more than one type. None of the seven

P: mat C: Place
shared types occurred in more than one of the five geographic

Range [Text] P: mat C: Place
regions. One type, for example, was found in two Australians.

C: Place Actor P: mat C: Freq + Actor
Among Caucasians, another type occurred three times and two

P: mat C: Freq C: Place Range
more types occurred twice. In New Guinea, two additional

P: mat C: Freq + Token P: rel Val
types were found three times and the seventh case involved a

type found in six individuals.

Range
A histogram showing the number of restriction site differences

P: mat C: Place Token
between pairs of individuals is given in Fig.1; the average

P:rel
number of differences observed between any two humans is

Value Token P:rel Value C: Accomp
9.5. The distribution is approximately normal, with an

excess of pairwise comparisons involving large numbers of

differences.

BP2:4 para 10 (Inferences)

(From this information Cann, Stoneking and Wilson advance three hypotheses.)

[Text] Sayer P:verb Verbiage
First, they suggest that the "common ancestor" of all surviving

mitochondrial types -- all people -- was African in origin.

[Text] Actor P: mat Range
Secondly, they find that each geographically distinct

population stems from many lineages connected to the tree at

Sayer P: verb Verbiage
widely separated points. This suggests either that each

racial group has multiple origins or that each area was

[Text] Actor P: mat Goal
colonised repeatedly. Thirdly, they calibrate their "genetic

C: Means
clock" with archaeological data on the likely dates of the

Sayer
colonisation of New Guinea, Australia, and the New World. They

P: verb Verbiage
estimate that the mutation rate for mitochondrial DNA is about

Token P:rel Value
2 to 4 per cent per million years. This fits with data from

Actor [Text] P: mat
other species. The Berkeley researchers then extrapolate

C: Place
back to the likely date of the "common ancestral mitochondrial

Sayer P: verb Verbiage
genotype". They conclude that the mitochondrial DNA of all

living humans could be derived from a single woman who lived in

Africa between 140 000 and 290 000 years ago.

BL2:4 paras 14-19 (Inferences)

African origin

Senser P:ment C: Place [Dir] Phenom
We infer from the tree of minimum length (Fig.3) that

Africa is a likely source of the human mitochondrial gene pool.

Actor P:mat C: Place
This inference comes from the observation that one of the two

primary branches leads exclusively to African mtDNAs (types 1-

7, Fig.3) while the second primary branch also leads to African

C:
mtDNAs (types 37-41, 45, 46, 70, 72, 81, 82, 111 and 113). By

Means [Dir]
postulating that the common ancestral mtDNA (type a in Fig. 3)

Actor P: mat Range
was African, we minimize the number of intercontinental

migrations needed to account for the geographic distribution of

[Dir] P: rel Token
mtDNA types. It follows that b is a likely common ancestor

[Dir]
of all non-African and many African mtDNAs (types 8-134 in

Fig.3).

Multiple lineages per race

Range [Dir]
The second implication of the tree (Fig.3) -- that each non-

P: mat
African population has multiple origins -- can be illustrated

C: Quality C: Means P: ment [Text]
most simply with the New Guineans. Take, as an example,

Phenomenon
mtDNA type 49, a lineage whose nearest relative is not in New

Token P:rel Value
Guinea but in Asia (type 50). Asian lineage 50 is closer

C: Comparison
genealogically to this New Guinea lineage than to other Asian

Actor P: mat C: Quality C: Place
mtDNA lineages. Six other lineages lead exclusively to New

Guinean mt DNAs, each originating at a different place in the

[Dir] Goal
tree (types 12, 13, 26-29, 65, 95 and 127-134 in Fig.3). This

small region of New Guinea (mainly the Eastern Highlands

[Text] P: mat C: Means
Province) thus seems to have been colonised by at least seven

[Dir]
maternal lineages (Tables 2 and 3).

C: Means Actor P: mat Range
In the same way, we calculate the minimum numbers of female

[Dir]
lineages that colonised Australia, Asia and Europe (Tables 2

Goal P: "mat" C: "Place"
and 3). Each estimate is based on the number of region-

[Dir] Actor
specific clusters in the tree (Fig.3, Tables 2 and 3). These

[Dir] P:- [Modal]
numbers, ranging from 15 to 36 (Tables 2 and 3), will probably

-mat C: Time
rise as more types of human mtDNA are discovered.

Tentative time scale

Goal P: mat C: Place C: Means
A time scale can be affixed to the tree in Fig.3 by assuming

that mtDNA sequence divergence accumulates at a constant rate

Value P: rel Token
in humans. One way of estimating this rate is to consider

the extent of differentiation within clusters specific to New

[Dir]
Guinea (Table 2; see also refs 23 and 30), Australia[30] and the

Actor P: mat Goal C: Time
New World[31]. People colonised these regions relatively

recently: a minimum of 30 000 years ago for New Guinea[32], 40

000 years ago for Australia[33], and 12 000 years ago for the New

Actor P: mat Ben Range
World[34]. These times enable us to calculate that the mean

rate of mtDNA divergence within humans lies between two and

Actor
four percent per million years; a detailed account of this

P: mat C: Place Token P: rel Value
calculation appears elsewhere[30]. This rate is similar to

previous estimates from animals as disparate as apes, monkeys,

Senser
horses, rhinoceroses, mice, rats, birds and fishes[15]. We

[Text] P: ment Phenomenon Attribute
therefore consider the above estimate of 2%-4% to be reasonable

C: Concession
for humans, although additional comparative work is needed to

obtain a more exact calibration.

C: Comparison Actor P:mat Goal
As Fig.3 shows, the common ancestral mtDNA (type a) links mtDNA

types that have diverged by an average of nearly 0.57%.

C: Condition Sayer P: verb
Assuming a rate of 2%-4% per million years, this implies

Verbiage
that the common ancestor of all surviving mtDNA types existed

C: Compar Actor P:
140 000-290 000 years ago. Similarly, ancestral types b-j may

mat C: Time [Dir]
have existed 62 000-225 000 years ago (Table 3).

[Text] P:- Actor -mat Actor
When did the migrations from Africa take place? The

oldest of the clusters of mtDNA types to contain no African

P: mat C: Place + P: rel Possessed [Dir]
members stems from ancestor c and included types 11-29 (Fig.3).

Token P:rel
The apparent age of this cluster (calculated in Table 3) is

Value Actor P: mat Range C:
90 000-180 000 years. Its founders may have left Africa at

Time [Text] [Dir] P:rel Attrib Carrier
about that time. However, it is equally possible that the

[Dir]
exodus occurred as recently as 23-105 thousand years ago (Table

Sayer P: verb Receiv Verbiage
2). The mtDNA results cannot tell us exactly when these

migrations took place.

BP2:5 paras 14-17 (Qualifications & conclusions)

[Text] Token C: Concession
What about the African origins of Eve? Although evolutionary

studies of nuclear genes do not, so far, contradict this idea,

Existent P: ex C: Time C: Purpose
not enough data exist yet to confirm the hypothesis

C: Quality Actor P: mat
unequivocally. Studies of the Y chromosome might provide

Range C: Comparison
supporting evidence. Just as mitochondria transmit only

[Text] Actor P: mat C: Quality
through the mother, so the Y chromosome transmits only

C: Means Possessor P: rel Possessed
through the father; women have two X chromosomes,

Possessor Possessed [Text] Actor P:mat C: Place
men one X and one Y, so the Y comes down through the

C: Concession
male line. Although a limited degree of recombination between

the X and Y chromosomes probably does occur, and genetic

Actor
material is swapped between the two chromosomes, DNA probes

P: mat Range C: Place
could search for regions of the Y chromosome where this does

Range P: mat C: Purpose
not happen often. The results could be employed to find a

C: Freq Senser P: ment
common paternal ancestry. Once again you might expect

Phenomenon
to find a common "paternal" ancestor and calculate, in much the

P: ment [Text] Phenom
same way, how long ago he lived. Suppose, however, that

because of mating patterns that are not random, paternal lineages go extinct and are lost at a rate different from

Range [Text] P: mat C: Place
maternal lineages. (This too is illustrated in the figure:

seven of the mitochondrial lineages are lost within four

[Text]
generations; two of the four Y lineages persist.) For

Actor
instance, polygyny, with some males having more than one mate,

P: mat Range
would result in a higher proportion of males than of females

Actor P: mat C: Qual C: Comparison
not reproducing. Y lineages would vanish faster than

Actor
mitochondrial lineages. The "common paternal ancestor", call

P: -
him Adam, from whom all the current Y lineages diverged might

[Text] -mat C: Time [Text] C: Comp
then have lived much more recently than Eve. So rather than

Actor P: mat C:
being derived from Adam's spare rib, Eve may have lived a few

Time Value P: rel Token
millenia before him. The point is not that the mother of

us all was any less "modern" than the father of us all, only

that rates of divergence of these two specific portions of the

genome differ.

[Text] Goal P: mat C: Means
Finally, the hypothesis should be qualified by a re-examination

[Text] P: rel
of the assumptions inherent in the method. How valid is

Token
the statement "typical mammalian females...behave as haploids",

that is, as though they possess a single set of unpaired

chromosomes, as far as their mitochondria are concerned?

C: Concession
Although recombination between mitochondrial genomes has never

Actor P: mat Range
been demonstrated, recent studies in cows have shown that a few

[Text] Possessor
are "heteroplasmic" or "mosaics". In other words, an

P: rel Possessed
individual cow may contain a 50:50 mix (or some other

proportion) of two mitochondrial genotypes, rather than just

[Text] P:- Carrier
one genotype. How does a new mitochondrial mutation

P: rel Attribute C: "Place" P: ment Phenomenon
become established in an individual? Suppose a single

variation occurred in one mitochondrial genome out of the

[Text] P:- Actor
thousands of others in each cell; how could this mutated

P: mat Goal C: Behalf
genome alone populate the embryo against the competition from

Value P: rel Token
the others? The simplest explanation is that some kind of

bottleneck exists so that only a tiny proportion of the

mitochondria in the ovum contribute to the embryo's

[Text] Token P: rel
mitochondrial genotype. Alternatively, the individual might be

Value
a mosaic with two mitochondrial types existing in equilibrium.

C: Condition [Text] Token P: rel Value + Actor
If this is so, then it is extremely rare, and one or

C: Qual P: mat C:-[Text]
other mitochondrial population rapidly takes over. If then,

Condition
there are individuals whose mitochondrial range is effectively

P:rel Token
diploid, with contributions from two mitochondria, is a

Value [Text]
mutation the only possible source of variation? What about

Token
a rare paternal contribution or some kind of recombination

Actor P: mat Goal
event? Any of these would complicate the idea that individuals

are haploid for their mitochondrial genotype.

Senser P: ment Phenomenon
The "mitochondrial clock hypothesis" assumes a uniform rate of

\+ Actor P: mat
mutation over long evolutionary time. But researchers find

[Dir] Attrib Range [Text] C: Cond
it hard to see how this could be tested. However, should

they discover that a significant proportion of supposedly

neutral mitochondrial mutations affect genetic fitness,

Senser
researchers relying on the accumulation of mutations as a clock

P: ment C: Freq
to time evolution would need to think again.

Token P: rel Value
The Mother Eve hypothesis is an important insight into

Actor P:-
human origins. The study of mitochondrial lineages will

[Modal] -mat Ben C: Result
doubtless help us to unravel some of the movements and

migrations of people as they spread around the Earth.

BL2:5 paras: 26-27 (Conclusions)

Conclusions and prospects

Sayer P: verb Verbiage
Studies of mtDNA suggest a view of how, where and when modern

humans arose that fits with one interpretation of evidence from

Range
ancient human bones and tools. More extensive molecular

P: mat C: Purpose
comparisons are needed to improve our rooting of the mtDNA tree
and the calibration of the rate of mtDNA divergence within the
Actor P: mat Range
human species. This may provide a more reliable time scale
for the spread of human populations and better estimates of the
number of maternal lineages involved in founding the non-
African populations.

[Dir] P:rel [Text] Value Token
It is also important to obtain more quantitative
estimates of the overall extent of nuclear DNA diversity in
C: Means
both human and African ape populations. By comparing the
[Dir] P: rel Attrib
nuclear and mitochondrial DNA diversities, it may be possible
Carrier
to find out whether a transient or prolonged bottleneck in
[Text]
population size accompanied the origin of our species[15]. Then
Actor
a fuller interaction between palaeoanthropology, archaeology
P: mat Range
and molecular biology will allow a deeper analysis of how our
species arose.

Field: Biology No.3
Popular article: "No domestic bliss" (BP3)
Learned article: "Morphological discriminants of Scottish wildcats (Felis silvestris), domestic cats (F. catus) and their hybrids" (BL3)

BP3:1 para 1-7 (Introduction)

Senser
Ceaseless persecution and the loss of suitable habitat nearly

P: "ment" Phenomenon
saw the extinction of the Scottish wild cat at the turn of

Actor
the century. Only a relaxation in the zeal of gamekeepers and

the rapid spread of coniferous plantation after the First World

P: mat Range C: Result
War have allowed the wild cat to recolonise many of its former

haunts in Scotland.

\+ C: Time Actor P: mat Range
But today a more insidious fate may be awaiting the Scottish

C: Time Actor P: mat C: "Place"
wild cat. This time the threat comes not from man, but from

the feral domestic cat.

Token P:rel Value
The Scottish wild cat and its European cousins are the forest

forms of a very widespread species of wild cat found also in

the deserts of south-west Asia and the grasslands of Africa.

Token P: rel Value
The African form of the wild cat resembles a slender, light-

\+ P: rel Attribute
coloured tabby and looks quite different from the burly

European wild cats with their bushy, blunt-tipped tails.

Token P: rel Value
The African wild cat is the direct ancestor of domestic

Goal P:- [Modal] [Text] - mat C: Time
cats. They were possibly first domesticated by about 6000 BC

C: Place + P:- [Modal] ment Attrib
in Cyprus and the Near East, but are definitely known to have

been fully domesticated by the Ancient Egyptians some 3000
Carrier P: rel
years ago. The mummified remains of domestic cats were

Value C: Place C: Result
so common in the tombs of Ancient Egypt that during the 19th

century more than 19 tons of them were shipped to Britain to be

Actor P: mat
ground up and turned into fertiliser. The domestic cat has

Range C: Accomp C: Result
travelled the world with man to become the cosmopolitan

carnivore it is today.

C: Concession Carrier P:- C: Temporal -rel
Although domesticated by man, cats have always been

Attribute C: Time
capable of reverting to a wild or feral existence. As the

[Text]
Scottish wild cat was ruthlessly eradicated from Britain, so

Range P: mat
its place as the main predator of rodents and rabbits was taken

Actor C: Time
by feral and domestic cats. Once the wild cat began to recover

[Text] Actor P: mat Range
from man's persecution, so it came into contact with

+ Carrier
domestic cats and hybridisation between such closely related

P: rel Attrib
animals was inevitable.

C: Time Actor
Recently, Don French and Laurie Corbett of the Institute for

Terrestrial Ecology, Banchory, and Nigel Easterbee of the

P: mat Range
Nature Conservancy Council in Edinburgh have investigated just

how much hybridisation has occurred between wild and domestic

C: Reporter
cats over the last 100 years (Journal of Zoology, vol. 214,

Sayer P: verb Verbiage
235-259). The results of their study suggest that the

continued existence of the Scottish wild cat may be threatened

Goal P: mat
by hybridisation. The Scottish wild cat could be inundated

Actor
by a steady flow of genes from the domestic cat population.

[Dir] P: rel C: Freq Attrib Carrier
It is not always easy to tell whether an animal which

looks like a Scottish wild cat is tainted with domestic cat

[Text] Actor
blood. However, a careful analysis of several skull

P: mat Range
measurements can reveal not only whether the cat is wild or

domestic, but also if there has been any significant

hybridisation.

BL3:1 1-6 (Introduction)

Introduction

Carrier P:rel C: Time Attribute
Wildcats (Felis silvestris) were formerly widely distributed

C: Place
and relatively common throughout the British Isles, except

\+
Ireland and the 'Outer Islands' (Orkney, Hebrides, etc) and

Attrib C: "Time" C: Reporter
present at least as far back as the Pleistocene (Stuart. 1974;

C: Time [Text] Actor
Yalden, 1982). By the end of the 19th Century, however, they

P: mat C: Place +
had disappeared from England, Wales and southern Scotland and

P: re; Attrib C: Place
become scarce even in the Scottish Highlands.

Goal P: mat C: Place C: Time
Domestic cats (F. catus) were introduced into Britain much

C: Time Actor [Modal] [Text]
later, in about the 11th century by the Normans, possibly also

C: Time Actor C: Reporter +
earlier by the Romans or Vikings (Zeuner 1963; Hyams 1972) and

Carrier P: rel C: Time Attrib C: Place
feral domestic cats are now common throughout Scotland.

C: Time [Dir] P: ex Existent
Over the past 60 years or so, there has been a considerable

C: "Place"
recovery in the Scottish wildcat population from its 19th

C: Reporter
Century 'low' (Taylor, 1946; Jenkins, 1962; Hewson, 1967;

Carrier P: rel Attribute
Corbett, 1978). This increase may have been partly due to

\+ P:-[Text]-rel
changes in availability of habitat and food, but may also have

Attribute
been partly because of crossbreeding between wild and domestic

C: Result
cats, with the hybrids subsequently identified (wrongly) as

[Dir] P: ex Existent
wildcats. There are several (mainly anecdotal) reports of

C: Reporter
hybridization both in captivity (Gray, 1971) and in the wild

C: Reporter + Range P: mat
(e.g. Pitt, 1939), but few have been authenticated.

Actor P: mat Range
Many authors have attempted to distinguish wildcats from

C: Means
domestic tabby cats and hybrids using:

(i) coat colours and external body measurements

(ii) variations in size and shape of skull and jaw bones

(iii) length of the small intestines

(iv) variations in gene frequency for coat colour, and

(v) differences in blood enzyme systems.

C: Purpose P: ment Phenomenon
(For a list of relevant references see Appendix C)

Possessor P: rel Possessed
All these studies had a common bias in the lack of adequate

standard or 'genuine' wildcat material for comparison with

C: Reason
other wildcat populations and suspected hybrids, since most

'wildcat' specimens in museums were collected during this

century and suspected hybridization may have been occurring

C: Reporter [Text]
over several centuries (see e.g. Suminski, 1962a). Further,

Actor P: mat Range
many analyses use linear measurements which may not take

\+ Actor
into account age or sex differences, and even ratio

P: mat Range C: Condition
measurements may give doubtful results if there are variations

C: Reporter
in material collected from different localities (Derenne, 1972)

C: Reporter
or environments (Glass & Todd, 1977).

C: Place Actor P: mat Range
In this paper, we aim to provide a quantitative

classification of Scottish wildcats in relation to domestic

C: Means
cats and hybrids between these two species, based on skull

Actor P: mat Range
morphometrics. We attempt to overcome the biases inherent in

C: Means
earlier studies by comparing known domestic cats with

C: Result
populations of presumed wildcats collected at different time periods in Scotland, thereby eliminating the assumption of

Senser P: ment Phenomenon
'pure' wildcat material. We assume that hybridization has

[Text] Actor P: "mat" Range
occurred widely. Also, this method should reflect any changes

C: Means
in the rate or degree of hybridization by showing different degrees of affinity between domestic cats (or hybrids) and

[Text] C: Condition
'wildcats' collected at different times, e.g. if the rate of

Senser P: ment Phenomenon
hybridization has increased we would expect modern 'wildcats' to be more closely related to domestic cats than those collected earlier this century.

BL3:1 (cont) paras 55-63 (Summary of above; cf BP3: para 7)

Summary

Actor P: "mat" C: "Place"
1. This paper aimed at identifying populations of wildcats (*Felis silvestris*), domestic cats (*F. catus*) and their hybrids,

Range P: mat C:Role
by skull morphometrics. Wildcat samples were classified as 'old' (collected 1901-1941), 'recent' (1953-1963) and 'modern'

+ Range
(1975-1978) and skull measurements of these three groups

C: Accompaniment P: mat
together with samples of hybrid and domestic cats, were

C: Means
compared using Fisher Linear Discriminant Functions (FLDF), Principal Component Analyses (PCA) and Canonical Variates (CVA).

Actor P: mat Range
2. All analyses showed that 'old' wildcats were different from
all other groups.

[Dir] P:ex Existent
3. There was little or no difference between 'recent' and
Range P: mat C: "Place"
'modern' wildcats. Both groups were separated not only from
domestic cats, but also from 'old' wildcats.

Carrier P:rel Attribute C: "Place"
4. The hybrid group was the most variable. In PCA, and
Actor P: mat C: Quality Range
particularly in CVA, it overlapped extensively with both
+ Actor P: mat Range
'recent' and 'modern' wildcats, and FLDF produced most
misclassifications between hybrids and other groups.

Possessor P;rel Possessed C: Comparison
5. Wildcats had larger, more robust skulls than domestic
+ Token P:rel Value
cats, and all the distinguishing variables were characters
related to stalking, catching and killing of prey.

Carrier P:rel Attrib C: "Place" C: Comp
6. Sexes were most distinct in 'old' wildcats, less so in
+ C: Comp
domestic cats and 'recent/modern' wildcats, and least in
hybrids, where the pattern of variation was also different from
all other groups.

Sayer P:verb Verbiage
7. We concluded that 'old' wildcats were probably a
(relatively) 'pure' population of <u>F. silvestris</u>, but that
'recent/modern' wildcat populations contained a (relatively)
high proportion of hybrids.

Actor [Modal] P: mat C: Time
8. Most hybridization probably occurred earlier in this

Possessor
century, when wildcat numbers were low. The increase in

P:- [Text]
'wildcat' numbers over the past 50 years or so may therefore

P: rel Possessed Ben P:- [Modal] -mat Actor
include many hybrid cats. It was probably aided by increased

afforestation in Scotland.

Carrier P: rel Attribute
9. 'Modern' wildcats tend to be slightly less like

hybrids/domestic cats and slightly more like 'old' wildcats

C: Comparison C: Result
than do 'recent' wildcats, so the present trend may be to

\+ [Dir] P: rel Token
reduce hybridization; but it may be that the 'pure' form of

wildcat is effectively extinct in Scotland.

BP3:2 para 8 (Extent of hybridization)

Actor P: mat Range
French and his co-workers discovered that wild cats had,

indeed, hybridised extensively with domestic cats as they

spread from their last stronghold in the western Highlands more

C: Time Possessor
than 70 years ago. As wild cats moved into new areas, they

P: rel Possessed
would have had few opportunities to mate with their own kind

\+ [Text] P: mat Range
and instead would have resorted to mating with their distant

domestic relatives.

BL3:2 paras 32-38 (Extent of hybridization)

Carrier P:rel [Text] Attribute C:"Spat'l"
The overall pattern is therefore much as expected insofar as

wild and domestic cats are on opposite sides of the hybrid

[Text] C: Comparison
group, along a simple chain. However, as was indicated by

C: Comparison
FLDF, while old wildcats were totally separated from both

Actor
domestic cats and hybrids, recent and modern wildcats both

P: mat Range C: Quality
overlapped the hybrid group quite considerably.

Carr P:rel Attrib C: "Place" C: Time
This was particularly so in females, or when

[Text] C: Cond
both sexes were lumped together, as in FLDF. Indeed, if recent

and modern wildcats were combined as a single group (except for

a single modern male, their ranges are indistinguishable), and

Sayer
sexes also combined within groups, as in FLDF, the component

[Dir] C: Freq P:verb Verbiage
scores (Fig.5) consistently suggest just three 'primary'

groups: domestic cats, hybrids and old wildcats -- with recent

and modern wildcats together forming a 'secondary' group,

intermediate between old (presumed 'pure') wildcats and

Actor [Text] P: mat Range
hybrids. This in turn corroborates the conclusion from FLDF

that old wildcats and domestic cats were both essentially

'pure' forms, but that recent and modern wildcats contained a

higher hybrid component.

Range P: mat Actor
Additional support for this conclusion is given by the

distances in component space between group centroids, and the

degree and direction of sexual dimorphism within groups.

C: "Place" [Dir] Token
Between groups (Table IV, see also Figs 3 & 4), old wildcats

P:rel C: Time Value C: Comparison
were always further from hybrids than either modern or recent

[Range P: mat C: Qual C: Place C: Purpose]
wildcats (sexes are given separately in Table IV to avoid

C: Comparison
distortion from widely differing sex ratios), where the

females, especially, were so close to hybrids as to be

Token
essentially indistinguishable. Distance between domestic cats

P:rel [Text] Value
and hybrids were, however, very similar to those between old

Carrier P:rel
wildcats and hybrids. Modern and recent wildcats were not

Attribute + C: "Place"
clearly separable from each other but, in the males at least,

Token P:rel C: Time Value
recent wildcats were always further from old wildcats, and

C: Comparison C: Condition
closer to hybrids, than were modern wildcats. Taking sex

Sayer P: verb Verbiage
ratios into account, the results imply a general ordering of

distances, over both sexes together, of:

[modern:recent]
<<[recent/modern:old recent/modern:hybrid]
<[domestic/old:hybrid].

C: Freq Token P: rel Value
Again, domestic cats and old wildcats appear to be essentially

\+ Possessor P: rel
'pure' groups, but modern and recent wildcats do include

Possessed
a significant hybrid fraction.

Actor [Dir] P: mat Range
Differences between sexes within groups (Table V) showed a

Token P:rel Value
similar pattern. Recent and modern wildcats were almost

identical to domestic cats in this respect, and very different from old wildcats, where sexual dimorphism was much greater.

Actor P: mat Range + Token
Hybrids showed very little difference between sexes and what

P:rel Value
difference there was, was of a completely different kind from

[Dir]
all other groups (e.g. Fig.3).

[Text] Carrier
Conversely, the largest variation within group and sex

(measured by mean difference from group/sex centroid, with

P:rel
recent and modern wildcats combined as a single group) was

Attribute
in hybrids, which were always at least 1.5 times as variable as

Tok P:rel C: Freq Value
the next most variable group. This was usually domestic

Token P:rel Value
cats. Recent and modern wildcats were similar to, or slightly

[Dir] [Dir] P:rel [Txt]
less variable than, domestic cats (Table VI). It was also

Attrib Carrier
notable that while in old wildcats and domestic cats

(especially the former) males were consistently more variable

than females, both hybrids and recent/modern wildcats

frequently had females as variable, or more variable than

males.

C: Freq Sayer P:verb Verbiage
Yet again, the results imply a significant hybrid component in

recent and modern wildcat populations (possibly slightly less

so in modern wildcats) but not in old wildcats or domestic

cats.

BL3:2 paras 49-51 (Reasons for hybridisation)

[Dir] P: ex Existent
There seems to have been a sudden, intensive period of

C: Time
hybridization just prior to the recent wildcats, ie around the

[Text] P:rel Token
1940s. What are the likely causes of this change?

Actor P: mat C: Freq C: Time C: Comp
Hybridization may have occurred more frequently then than in

C: Reason [Text] C: Concession
earlier times for two main reasons. First, although their

Token P:rel C:Time
geographical range was increasing, wildcat numbers were then

Value C: Reporter C: Reason
very low (e.g. Langley and Yalden, 1977), probably because of

high mortality (due to gamekeepers) and the small area of

Actor P: mat
forest (compared to more recent times). Forests provide

Range C: Time C: Accompaniment
shelter in winter as well as food (especially rodents).

Actor P: mat Range
Corbett (1978, 1979) showed that adult wildcats in north-east

Scotland are territorial, with the territory centred within or

Sayer [Text] P: verb Verbiage
adjacent to forest. He also described a positive

correlation between wildcat density and area of suitable

forest.

[Text] C: Time Possessor P: rel
Secondly, when wildcat numbers were low, they may have had

Possessed
difficulty finding conspecifics with which to mate, but no

C: Reason
trouble locating domestic cats, as numbers of feral domestic

cats (e.g. from abandoned farms) were then relatively high.

C: Freq Range P: mat Actor
Normally such crossbreeding would be prevented by 'agonistic'

C: Reporter + Actor
behaviour (Corbett, 1979), but the combination of low wildcat

P: mat
numbers and a high density of feral domestic cats may have

Goal
reduced the effectiveness of these isolating mechanisms,

C: Result
allowing significant hybridization.

BP3:3 paras 11-12 (Odd cats; odd colours)

C: Freq [Dir] P:ex Existent C: Place
From time to time there are stories in the press, on radio

C: Matter
and television about large, usually black, leopard- or puma-

Attribute P:rel
sized cats roaming the British countryside. So newsworthy are

Carrier C: Result
these fearsome felines that they have earned popular names such

as the Surrey Puma and the Beast of Exmoor.

Actor P: "mat" Range
Some take the view that these mysterious cats are really

aliens from outer space who have transformed themselves into

pumas so that they can observe us and go unnoticed among the

[Modal] Actor P: mat Range
native fauna. Unfortunately, they chose the wrong side of

Token
the Atlantic to try out their subtle disguise. Some of these

P: rel [Modal] Value
cats, but very few, are almost certainly "pets", which have

been released to fend for themselves after getting too big for

Phenomenon P: mental C: Time
the cat flap. The Surrey Puma was sighted over several years

+ [Modal] P:"mat" C: "Place" C: Time
in the 1960s and probably falls into this category. This

Range
year two leopard cats, so named because of their spots not

P: mat C: Place Token
their size, were found in Scotland and on Dartmoor. These

P:rel [Modal] Value C: Reason
were definitely escapees because the nearest wild leopard cats

are found in India.

BP3:3 (cont) para 14 (Odd cats; odd colours, cont.)

Ben P: "mat" Range
The large black Kellas cats have received much popular

C: Role +
attention as being a species of cat new to science. But,

[Modal] Token P:rel Value
without any doubt these animals are merely hybrids between

+ P: rel Value C: Comp
domestic and Scottish wild cats and are no bigger than a

C: Condition
large Scottish wild cat. If domestic cats are having an impact

Senser P: ment Phenomenon
on wild cat populations, we would expect even more colour

C: Time Actor P:mat
varieties to turn up. Only the other day Nigel Easterbee came

Range [Dir] P:-
across a white "wild" cat with very faint stripes. It will

[Modal] -rel Value Token
probably not be long before we get a ginger tom or a

tortoiseshell.

BL3:3 para 44 (Odd colours)

Carrier P:-[Text]-rel
Distinguishing hybrids from domestic cats may also be

Attrib C: Condition
difficult, especially if one has to rely on non morphometric

[Text] Phenom
characters for preliminary identification. For example, one

P:- C: Time -ment Value
cat in our sample was originally thought to be a domestic cat

C: Reason + C: Time
(because of a basically black pelage) but, in preliminary runs

P:- C: Freq -mat Sayer
of FLDF, was constantly 'misclassified'. Subsequent

examination of other characteristics (e.g. intestine length)

P: verb Verbiage + Range
indicated that the FLDF result was, in fact, correct, and the

P: mat C: Role Verbiage
cat was reclassified as a hybrid. The doubtful reliability of

P: verb
pelage characters as a guide to identifying hybrids was

Sayer
confirmed by crossbreeding experiments, in which hybrids with

pelage colours ranging from mottled tabby to completely black

C: Time Range
were produced. More recently, a series of large black cats

C: Reporter
trapped or shot in Morayshire (see e.g. Steele, 1985 for a

P:- C: Quality -mat Value
typical press account) have all been shown to be almost

C: Means
certainly hybrids, by anatomical measures such as those used

C: Reporter C: Reporter
here (Hills, 1986), and chromosome markers (D. Fox, pers.

comm.).

BP3:4 paras 9-10 (Conclusion of skulls report)

Carrier P: rel Attribute C: Means
The Scottish wild cat does seem to be threatened by

\+ [Dir] P:ex Existent
hybridisation, but there may be some hope for our only wild

Token P:rel Value
feline. A sample of skulls from the 1970s were much more
similar in shape to the pure-bred wild cats of the last

[Dir] P:rel Value To- C: Time
century. It is possible that now the Scottish wild cat

-ken
population has stabilised, hybridisation with domestic cats is

+ Actor P: mat C: Accom
reduced. Or, a new type of wild cat may have evolved with a

Value
mixture of wild and domestic cat features. The trouble with

P: rel Token
skull measurements is that we can not really be sure what
is happening.

Actor P: mat Goal C: Accom
Nigel Easterbee is trying to sort out this problem with

C: Means
Alexandra Hubbard by looking at differences in the DNA of wild,

Actor P:-[Text]-mat C: Accomp
domestic and hybrid cats. He is also working with Richard

C: Purpose
Boid and Steven McCorist to look at genetic markers in the

[Dir] P: rel Attrib Carrier
blood of cats. It should be possible to find out how much
interbreeding has been going on, where it is happening and
whether there are any pure-bred wild cats left in Scotland.

"Actor" P:- C: Time -mat C: Result
The work has only just begun so that it will be some time
before we know the extent of the threat to the Scottish wild
cat.

BP3:4 (cont) para 15 (Conclusion)

[Dir] P;rel Attribute Carrier
It is critical that we find out exactly what is

C: Purpose
happening to the Scottish wild cat so that, if necessary, we can prevent its extinction by gene flow rather than wasting time and money chasing mythical beasts around the British countryside.

BL3:4 paras 52-54 (Conclusion)

[Text] P:rel Attrib Actor P:mat
What future changes are likely? Numbers of 'wildcats' have

C: Time C: Reporter C:Comp
increased in recent years (Taylor, 1946; Jenkins, 1962), as has

C: Reporter
afforestation throughout Scotland (McNeill, in O'Dell &

\+ Token
Mackintosh, 1963; McVean & Lockie, 1969), and the two events

P:rel Value Sayer P: verb Verbiage
are correlated. Our results suggest that a (possibly considerable) part of the apparent increase in 'wildcats' is probably not due to 'true' wildcats but to hybrids.

[Text] C: Concession
However, while we could not clearly distinguish recent from

[Dir] P:ex Existent [Dir]
modern 'wildcats', there are indications (e.g. Figs 3 & 4, Table IV) that modern 'wildcats' may contain a smaller proportion of hybrids than recent 'wildcats'.

Sayer [Text] P: verb Verbiage
We therefore suggest that there may be a slow drift back towards the old (pure) wildcat type; slow because of the

Phenomenon
increased opportunities for backcrossing. Whether 'pure'

P:- C:Qual -ment
wildcats will ever become re-established can only be

C: Means Actor

determined by similar future studies. A revision of the

P: mat

analyses reported here after, say, 20 years or so, could show

Range

whether a drift back had continued, or whether the 'pure' form of the wildcat is effectively extinct in Scotland.

Field: Computing No.1
Popular article: "Cognitive science meets the biological mind" (CP1)
Learned article: "PDP or not PDP: Is that the question?" (CL1)

Analogous passages

CP1:1 paras 1-2 (Introduction)

Sayer P:verb Verbiage
The Chinese philosopher Seng-Ts'an wrote: "If you work on your
mind with your mind, how can you avoid an immense amount of
[Modal] [Text] Token P:rel Value
confusion?" Perhaps, then, that confusion is the inevitable
Senser P: ment
lot of cognitive science. Cognitive scientists try to
Phenomenon
understand the mind -- what it is, how it works and how we can
Possessor P:rel Possessed
model it. We have no choice but to use our minds to
[Modal] [Text] Actor P: mat C: Quality
study the mind. Perhaps, though, we have relied too much
Range C: Comp
on an intuitive understanding of how the mind works, as if we
could turn our eyes inwards to mind, to discover our own
Token P:rel Value
cognitive processes. Cognitive science is an alliance of
disciplines -- philosophy, psychology and linguistics, to name
+ Range P: "mat" C: Place
a few. But it is centred on the relatively new discipline
C: Accom Actor P:mat Range
of Artificial Intelligence. With AI, it shares the aim of
trying to construct computers and computer programs that do the
sorts of things that minds do.

Actor P: mat C: Place
Two distinct traditions are emerging in cognitive science.

Actor
One, which for convenience I shall call the "mind's eye

P: mat Range
approach", accepts many of our intuitive ideas about how the

Range P: "mat" C: Place
mind works. The other is based on a new approach to designing

Actor P:mat
computers, known as "connectionism". This newer approach may

Ben Range
enable us to construct models of the mind that are similar in

form to the brain's own network of neurons.

CL1:1 paras 1-2 (Introduction)

0. Introduction

Token
PDP (Parallel Distributed Processing, a.k.a. Connectionism)

P: rel Value Possessor P:rel
is a hot topic in cognitive science. It has

Possessed
vehement supporters (e.g. Smolensky [forthcoming]) and equally

vehement detractors (Fodor and Pylyshyn [1988], Pinker and

C: Place Sayer P: verb Verbiage
Prince [1988]). In what follows I shall suggest that much

of this debate has the character of a (simulated) storm in a

[Style] Sayer P:verb Verbiage
(virtual) teacup. In short, I suggest that "PDP or not

PDP" is not the question.

Token P: rel Value [Text] Sayer
My strategy will be as follows. First (section 1), I

P:verb Verbiage + P: verb
sketch the broad outlines of PDP-style approaches and report a

Verbiage [Text] Senser P: ment Phenomenon
simple example. Then (section 2) I focus on a recent

C: Reporter [Text]
critique of PDP models (Pinker and Prince [1988]). Finally,

Sayer P: verb Verbiage
(sections 3 and 4) I propose a more ecumenical picture of the

possible relations between PDP-style and classical models.

CP1:2 paras 3-7 (The "smell" of intelligence)

Carrier P: rel Attrib C: Time
The mind's eye approach was prominent in the late 1960s and

Senser P: "ment" Phenomenon
through the 1970s. It focuses on tasks that we

intuitively consider to be interesting examples of reasoning

Possessor P: rel Possessed
and thinking. These cognitive achievements include playing

chess and other games, understanding stories, planning,

Value
problem-solving and scientific creativity. Striking

[Modal]
achievements indeed.

Actor P: mat Range
Researchers devised programs that did well at individual tasks.

Actor P: mat Range C: Quality Actor
Computers played chess at a level close to world-class; they

P: mat Range Senser P:ment
rediscovered one of Kepler's laws and Ohm's law. They learnt

Phenomenon C: Purpose
to re-use successful planning strategies to meet new demands.

Sayer P:verb Verbiage
They could answer questions about the stated implications of

[Text] Carrier P: rel Attrib Possessor
stories. Yet something seemed to be missing. The

P: rel Possessed
programmed computers lacked the smell of real intelligence.

Actor P: mat Range C: Qual + Actor
They could perform only a few tasks well. And they

P: mat Range C: Means + [Text]
performed these tasks in a somewhat inflexible way, and so

P:mat Range
made absurd errors which cast doubt on the claim that they

were illuminating the nature of human thought.

Actor P: mat C: Means
The mind's eye approach may err by placing too much faith in

Sayer P:verb
our intuitive view of the mind. Many of the programs echo

Verbiage [Text]
our common-sense understanding of mental states. For instance,

Actor P: mat Range
a researcher might write a program that tried to model the way

Actor P: mat
motivations and beliefs interact. Such a program might isolate

Goal
two sets of entities, one labelled "desires" and the other

\+ P: mat Range C: Place Actor
"beliefs", and allow interactions between the two. Such an

P: mat Range
approach follows our common-sense explanations of our actions.

Sayer C: Freq P:verb Verbiage C: Means
We normally explain an action by referring to a complex

[Text] Sayer P: verb
interplay of beliefs and desires. For example, we say

Verbiage
that Jane went up to the bar because she wanted a pint and

\+ Senser
believed that she could buy one at the bar. But this approach

P: "ment" Phenomenon
assumes that we can more or less directly translate beliefs

and desires into a description of relationships between

neurons.

[Text] P: ment Phenomenon
Why suppose that the natural way of understanding our

own (and others') mental states should prove a powerful model

Token
on which to base a scientific theory of mind? Talk about

P:rel Value C: Quality
beliefs and desires is a recent development in evolutionary

Attribute
terms, geared no doubt to smoothing our daily social

C: Condition
interactions. Even if it gives an adequate description of

Actor P: mat Range
behaviour, such talk need not give an accurate account of the

Possessor [Text]
computational structure underlying behaviour. We thus

P:rel Possessed [Txt]
have cause to be suspicious of the mind's eye approach. How

P:- Actor -mat
else might a computational investigation proceed?

Value P:rel Token
One alternative is to adopt an approach that concentrates on

Actor
more primitive biological achievements. American high-school

P: mat Range C: Role
yearbooks single out a few individuals as possessing the kinds

of traits required for future success ("The person most likely

C: Place Carrier
to..."). In the biological yearbook, the list of star

P:rel Attrib Possessor P: rel Possessed
qualities is revealing. It includes processing and

integrating information from the senses, fine sensory, motor

and spatial skills, and the capacity of the senses to cope with

Actor P: mat Range
inconsistent data. The most basic lifeforms must solve many of

Actor P:mat Range
these problems. Hamsters and even slugs solve some of them.

Carrier P:rel Attribute C: Comp
Such achievements are not as intuitively "cognitive" as chess-

+ Possessed P:rel
playing and the like. But the secret of real intelligence may

C: Place
be contained in lessons that humble creatures can teach us.

Carrier P:rel Attribute
Our ability to reason may be due to an underlying form of
computation that evolved to solve basic problems.

CL1:2 paras 34-35 (The nature of intelligence)

Actor [Text] P: mat Range
Mixed models thus require multiplex forms of psychological/

Phenomenon
computational explanation. Not just different cognitive tasks,

C: Time P: ment Attrib
but different aspects of the same task now look in need

C: "Spatial"
of different kinds of computational explanation. Insofar as

human beings are required to negotiate some truly rule-governed

Token
problem domains (e.g. chess, language, mathematics) some form

P: rel Value
of mixed model may well be nature's most effective solution.

Carrier
The apparent success of thoroughly soft PDP systems in

negotiating some such domains (e.g. the model of past-tense

P: rel Attribute
acquisition) may be due to the presence of a concealed 'bolt-

[Text] C: "Place"
on' symbol-processing unit -- us! Thus in the past tense

Ben P: mat Range
acquisition model, the system received stems and then inflected

C: Reason
versions because we chose to divide the verbs up like that.

Sayer P: verb Verbiage Attribute
Pinker and Prince describe this choice as relying on 'intuitive

[Text] C: Quality Possessor
protolinguistics'. So in that sense, even the Rumelhart and

P:rel Possessed [Text]
McClelland system has a bolt-on symbolic component! At any

C: Condition [Text]
rate, if mixed models are (for whatever reason) required, then

Possessor P:rel
the consequences must include:

> Possessed
> 1. The rejection of the claim that any model exhibiting classical componential structure is a mere implementation of a classical theory.
> 2. The rejection of the claim that any classical account is at best an approximation to a correct PDP-based account.

[Text] Range P: "mat" C: "Place"
Instead, correct explanations must be geared to the virtual

machine responsible for particular aspects of task performance.

Carrier P:rel Attrib [Modal] [Dir] P:rel
All of which is nicely ecumenical I'm sure. It would be

Attribute [Text] Carrier
boring, however, to close without making at least one

[P:ment Phenomenon C: Purpose
inflammatory claim. (See Clark (forthcoming) for an

] Value
extended development of all this.) The power behind our gross

symbol processing capacities -- the factor (or one factor)

P:rel
which makes us thinkers and e.g. SHRDLU not -- may well be

Token
the subsymbolic, pattern-matching power of something like a PDP

[Dir] P:ex Existent
mechanism operating within us. There is a strong intuition

that manipulating gross symbolic structure models the form of

Verbi-
some of our thought but somehow leaves out the content. The

-age P:- C: Freq -verb C: Means
intuition is often put by saying that such programs have

no understanding of what the symbol manipulations mean.

[Modal] [Text] Token P:rel Value
Perhaps, then, our notion of understanding involves the ideas

of spontaneously seeing patterns, spotting similarities,

[Verbiage P:-C: Quality
shading meanings and so on (This position is most strongly

-verb C: Place] C: Matter
advanced in Hofstader (1985).) Of the two 'modes of thought'

[Dir] P:rel Token
treated in this paper, it would seem the PDP mode is in some

Actor [Modal] P: "mat" Range
sense primary. This certainly fits our normal usage.

Act- P:mat -or Range Ben
We allow (many of us) thoughts of some kind to lower animals,

who are plausibly seen as advanced and complex PDP machines who

have not yet developed our capacities with symbolic

[Text] Actor P:mat Range Ben
representations. Yet we deny thoughts to BACON and

SHRDLU, programs which certainly manipulate gross symbolic

representations, but which lack any rich pattern matching

substructure.

C: Condition [Text] Actor P: mat Range
If this picture is correct, then we should maintain a dual

[Text] Sensr
thesis concerning explanation and instantiation. That is, we

P:ment Phenomenon...
should hold that

(i) Good psychological explanations will often involve mixed models and hence will require analysis in both PDP and classical (symbol-manipulating) terms.

\+ Senser P:- [Text] -ment
But we may also hold

Phenomenon
(ii) that the instantiation of any contentful psychological state requires not just the manipulation of gross symbolic structures but also access to the output of a powerful subsymbolic processor.

Actor P: mat Range
The Virtual Symbol Processor provides guidance and rigour;

Actor P:mat Range
the PDP substrate provides the fluidity and inspiration without

C: Reporter
which symbol processing is but an empty shell. In the words

Kant never used:

Carrier P:rel Attrib
Subsymbolic processing without symbolic guidance is blind;

Carrier P:rel Attrib
Symbolic processing without subsymbolic support is empty.

CP1:3 paras 8-12 (Description/Advantages of PDP)

Token
Neural networks, of the kind found in slugs, hamsters, monkeys

P:rel Value
and humans, are vast parallel networks of richly

C:
interconnected but relatively slow and simple processors (New

Reporter Carrier
Scientist, 16 July 1987, p 54). The relative slowness of the

P:rel Attrib C: Means
individual processors (neurons) is offset by having them work

in a kind of cooperative parallelism on the tasks at hand.

Actor P: "mat" Goal
A useful analogy captures some of the flavour of this

processing: the way commodity prices are fixed in an open

C: Place Act P: mat Range
market. In such a market we find only the local

C: Concession
interactions of buying and selling, albeit a large number of

Actor P:mat Goal
them. Local constraints govern each single such interaction --

how much the buyer wants the product, how badly the seller is

[Text] C: Result
in need of buyers and so on. However, as a result of these

Actor P: mat C: Place
local interactions, the system as a whole settles into a

C: Accompaniment
particular state of supply and demand with each trader

C: Time
responding to the activities of all the rest. At this point

Sayer P:verb Verbiage
we can say that the system has "relaxed" into a solution to

a global problem of price fixation, courtesy of all these local

Token P:rel Value
interactions. Vision and sensori-motor control are prime

examples of the usefulness of organising networks in parallel

cooperation.

Actor P: mat Range
Such networks can perform complex tasks, such as coordinating

C: Qual C: Place
movement with sensory inputs from our eyes, quickly. On this

Goal P: mat C: Purpose
model, each neuron (or group of neurons) is primed to respond

Range P:- [Text] -mat C: Place
to certain inputs. These neurons are also linked to other

Actor
neurons, each tied to its own type of content. Neurons with

P:mat Range C: Result
compatible contents form inhibitory links, reducing the

C: Means Actor P:"mat"
likelihood that either will fire. In this way we build up

Range
a global pattern of activation which does its best to respect

Goal
all the local constraints on the contents of the scene. The

P: mat C: Means
computational work is done by the overall patterns of

activation of these simple processing units, or neurons.

How to function well without data

Actor P:mat Range
Parallel networks or "connection machines" yield a number of

C: Time
important benefits when we are building computer models of

Value P:rel Token
biological intelligence. The first of these is "graceful

Token P:rel Value
degradation". This is the capacity to function plausibly

well despite the absence of what, on a more conventional

C: Time
computer, would amount to adequate data. When the system

Actor
receives part of a pattern it knows, the excitatory and

P: mat Goal
inhibitory connections between units complete the pattern.

Actor P:mat Goal C: Condition
The network can complete the pattern even if we include some

Actor P:- [Text]
incorrect or inconsistent data. Such a network can also

-mat C: Condition
continue to function if it loses some of the processing units,

C: Reason
for no individual set of units is vital to complete the

C: Place Token P:rel Value
pattern. In our earlier example this would correspond to the

overall market's capacity to tolerate the loss of a few local

trading interactions without affecting the overall picture of

[Text] C: Place Actor P:
supply and demand. Further, in the natural world, animals need

"mat" Range C: Condition
to make quick decisions despite messy data and occasional

Token [Text] P:rel
damage to the hardware. Graceful degradation, then, makes for

Value
biological star quality.

Carrier P:rel Attrib
The second benefit I wish to mention is somewhat more elusive.

Sayer P:verb Target Verbiage Token P:rel Val
I call it "informational holism". It involves the

integration of much of the stored information that we

[Text]
intuitively tend to see as separate, discrete lumps. Thus

P:ment Phenomenon
suppose you have a connectionist (parallel) network dedicated

Actor P: mat
to processing information about shape. The network would store

C: Matter C: Role
information about a particular shape (say a rectangle) as a

Range
potential pattern of activity of a set of units. These units

P: mat C: Place C: Place
are linked to other units in the recognition of shapes.

CL1:3 paras 3-5 (Description of PDP)

1. Parallel Distributed Processing

Token P: rel Value
Parallel Distributed Processing is a generic term covering a

class of models exhibiting a variety of algorithmic forms.

Value P:rel Token
What these forms have in common is a general type of

Token
architecture and a set of properties. The type of architecture

P: rel Value
involves a large number of simple processing units connected in

parallel by a network of excitatory and inhibatory connections.

Actor P:mat
These positively or negatively weighted connections encode (or

Range
come to encode) the data which the system is to store and

C: Place Senser P: ment Phenomenon
deploy. In some cases we may conceive each individual unit

C: Role
as representing a primitive hypothesis about some target

Actor P:mat C: Time
domain. The unit fires when it 'believes' the hypothesis is

Range P:-
true. Two units which stand for contradictory hypotheses may

[Text] -mat C: Means C: Cond
then be linked by a negatively weighted connection. If one

Actor P: mat Goal Range
fires, it will tend to inhibit the other. Mutually

P: mat Actor
supporting hypotheses may be linked by a positively weighted

Actor [Text] P:mat Range
(excitatory) connection. The links thus allow the individual

C: Result
units to excite and inhibit each other in a systematic manner.

Token P:rel C: Qual Value
The state of a unit at a given time will depend, in part, on

\+ Goal
the state of all the units to which it is linked. And those

[Text] P: mat Actor
units, in turn, will be influenced by all the units to which

Actor
they are linked. An iterative process of mutual adjustment of

P: mat C: Time Target
response ensues until a 'communal decision' is reached. This

P:- C: Freq -verb Verbiage
process is sometimes called <u>relaxation</u>.

[Text] P: ment Phenomenon
To take an example, suppose the initial state of activity of

the units is a direct function of a raw perceptual input in the

Goal [Token P:rel Value
form of an intensity array. Each unit (this is a

C: Reason
simplification -- groups of units would almost certainly be

] P: mat C: Purpose
required) is primed to respond to one kind of feature in such

Senser P:- [Text] [Text] -ment Phenomenon
an array. It must also, however, listen to the 'opinions'

C: Time Act
of any other units to which it is connected. In due course the

P: mat C: "Place"
global network should relax into a communal, internally

Token P: rel Value
consistent decision. This will amount to an interpretation of

C: Quality C:Cond
the intensity array in terms ultimately of a 3.D scene. If the

Actor
connections between the units have been well chosen, the system

P:- [C: Freq] "mat" Range Attribute
should (often) get it right.

Value [Text] P:rel Token
The essential point to note, then, is that connectionist

machines (as I shall use the term) are not just vast parallel

Token P:rel Value [Text] Value
processors. Parallelism alone is not enough. Rather, what

P:rel Token
counts is a process of cooperative group decision.

Actor P: mat [C: Means
Cooperative algorithms work to achieve (by a process of

] Range
iterative adjustment) an interpretation which respects

Carrier P:rel
constraints between neighbouring elements. Cooperation is

[Text] Attrib C: Comparison
therefore local, whereas the emergent order (the simultaneous

satisfaction of a large number of such constraints) is global.

Value P:rel Tok
A homely example (which I first heard from J. Stone) is that

C: Place Range
of the open market place. Here global patterns of supply

P: mat Actor
and demand are established by local interactions of buying and

Goal P:- [Text] -mat
selling. Overall knowledge of demand is thus distributed

C: Place + Goal C: Place
amongst buyers and overall control of supply amongst suppliers.

CL1:3 (cont) para 8 (Advantages of PDP)

Token P:rel
The way of encoding and retrieving specific information results

Value Token
in a functional correlate of prototype-based reasoning. This

P:rel [Modal] Value
is, in fact, a rather general property of PDP-style

Actor P:mat Range
approaches; they exhibit behaviour which, taken at face value,

might seem strongly suggestive of a reliance on some special

mechanism aimed at the generation and storage of explicit

hypotheses or rules concerning the central structures of a

+ [Modal] Range P: mat + Goal
domain. But in fact no special mechanism is required and the

P:- C: Quality -mat C: Quality
hypotheses are not explicitly stored, at least not in any

[Dir] P:rel [Modal] Attrib Carrier
normal sense. It is perhaps misleading to say that the

[Txt]
network does not in some sense learn and deploy the rules. For

Carr P:rel Attrib C: Quality
it becomes structured in a way which makes it yield outputs

which -- in a nicely flexible manner -- tend to 'conform to the

C: "Spatial"
rule'. Insofar as rules can ever be stored inside a head, or a

Token C: Time P:- [Modal] -rel Value
mechanism, this still seems to me to amount to a version

Attribute [Text] P:rel Carrier
of such storage. What is interesting, however, is that such

rules depend on no special mechanism of rule-generation and

storage and are represented in a manner which makes them

[Dir]
extremely flexible and sensitive to contextual nuances. It

P:rel C: Quality Token
is in this sense that;

> distributed models...provide alternatives to a variety of models that postulate abstract summary representations such as prototypes,... semantic memory representations, or even linguistic rules.
>
> C: Reporter
> McClelland, Rumelhart and the PDP Research Group (1986) Vol. II,p.267.

CP1:4 para 14 (Inadequacy of PDP model)

C: Condition
If the human mind is really a kind of connectionist machine,

Phenomenon P:- [Text] -ment C: Time C: Comparison
it does nonetheless look, at times, much more like a

traditional, serial, computer, processing information a bit at

C: "Place" Actor P: mat C: Quality
a time. In conscious reasoning we seem to move step by step

C: "Place"
through sequential operations on entities rather like

C: Quality Verbiage
sentences, following explicit rules. One theory which attempts

P:- C: Time -verb Sayer
to account for this phenomenon was recently propounded by two

of the leading lights in this field, David Rumelhart and James

Sayer P:verb Verb-
McClelland of the University of California. They suggest that

in the case of a few evolutionary recent achievements the human
mind simulates a serial computer, even though it is really a

Carrier P:rel Attrib
connectionist machine. The notion of simulation is familiar to

\+ P:mat Range
computer scientists, but needs to be treated with some care

Goal [Text] P: mat
here. A standard digital computer, for example, can be set up

C: Purpose
to compile programs from instructions written in a high-level

[Text] Actor P:mat Range
computer language such as Lisp. That is, it simulates a

different kind of machine -- one specifically designed for the

\+ [Text] P:- Actor
basic operations of Lisp. But how could a

-mat Range
connectionist brain simulate a radically different kind of
machine?

CL1:4 paras 9-10 (Inadequacy of PDP model)

Value Token Actor P:-[Modal] -mat
So much for the good news. PDP models do indeed seem to

Range
provide an alternative to classical models involving special
mechanisms of rule-generation and storage.

C: Time Token Range
Now for the bad news. Psychologically realistic models of

C: Reporter
our performance of some tasks, according to recent critiques,

P: mat C: Means
can be obtained only by positing something like a classical

[Text] Value
mechanism of rule-generation and storage. Hence a dilemma:

Token
Insofar as PDP models offer a distinct alternative to classical ones, they must be inadequate; insofar as they may be adequate, they must turn out to be mere implementations of classical models.

CP1:5 paras 16-17 (Conclusion)

Value
The intriguing answer suggested by McClelland and Rumelhart

P:rel Token
is that the brain uses external symbols located in the real

[Txt]
world to augment its internal capacity to process symbols. For

P:"mat" Range
example, take a conscious skill such as complex multi-

Sayer P:verb Verbiage
plication. They suggest that we can solve such problems

[Text]
because we have a simple capacity to complete patterns. For

C: Condition Actor C: Qual P: mat Goal
example, given 7x7 as input we simply complete the pattern

C: Place Range P: mat C: Accompaniment
to 49. This ability is combined with a capacity to provide

external symbols for bigger problems (for example 777x777).

Actor [Text] P:mat Range C: "Place"
We then deploy our basic skills in a series of operations

C: Accompaniment
on these external symbols, recording our results as we go

[Text] Goal P:mat Value
along. Thus 777x777 is reduced to a sequence of nine simple

\+ Verbiage P:verb
connectionist-style operations of 7x7 and the result read off.

Token P:rel
The first three such operations are :

Value
777
777
5439 and so on.

[Text] C: Reporter Senser P:ment
Ultimately, McClelland and Rumelhart believe, we learn

Phenomenon + C: Means
to do such sums "in the head", but only by creating a mental

model of the external symbols that we then operate on in

connectionist style.

C: Condition Token
If this radical conjecture is correct, the kind of explicit,

conscious reasoning that the mind's eye approach used as its

P:rel [Modal]
model of the underlying architecture of thought is really

Value Token P:rel Value
just the icing on the cake. It is a piece of complex

computational acrobatics that enables us to deal with a few

+ Token P:rel Value
recent problems. And it depends on cognitive resources

C: "Place"
formed in response to a different set of needs. To an

Token P:rel Value C:
evolutionary theorist this would be no great surprise. To

"Place" Actor P: "mat" C: Role
many cognitive scientists, it has come as a revelation.

CL1:5 paras 36-37 (Conclusion)

5. Conclusions

Sayer P:verb Verbiage
Pinker and Prince (1988) argue that PDP models will in general

C: Place
be inadequate to explain high-level cognition. In the present

Actor P:mat Range
paper we chose to accept the overall thrust of their

Sayer P: verb Verbiage
specific criticisms. These suggested the need for more
structure within any PDP model of past-tense formation, some
capacity for labelling and variable-binding and the use of a

\+ Verb- Sayer P:verb -iage
control structure. But accepting this, we argued, need not
lead us to conclude, along with Pinker and Prince, that any
improved model must constitute a mere implementation of a

[Text] Actor P: mat Range
classical theory. Instead, we developed a number of

C: Purpose
counter-examples to show that even where a system includes a
special lexical, rule-based component, the overall system need
by no means constitute a mere implementation of a classical

Token P:rel Value C: Reason
theory. This is so because (a) the classical components
can call and access powerful and distinctive PDP operations of
matching, search, blending and generalisation and (b) the
developmental process behind such a final system may itself
require PDP-style explanation.

Token [Modal] P:rel [Modal] Value
PDP or not PDP, it seems, is simply not the question.

Senser C: Condition
Cognitive science, if it seeks genuine psychological models of

P: ment Phenomenon
human thought, may need to recognise many kinds of virtual

C: Condition
cognitive machine. Even if we restrict our interest to a

Actor
single high-level task (e.g. past-tense acquisition) any full

P: mat Range
and satisfying account may require reference to a variety of

architectures implicated in different aspects of the task.

Carrier P:rel Attrib
Recognition of this architectural multiplicity may be necessary

C: Condition
if cognitive science is to avoid the costly and unproductive

polarisation caricatured in the dramatic idiom of the title.

Field: Computing, No.2
Popular article: "Vision leads robots from the factory" (CP2)
Learned article: "The Viewpoint Consistency Constraint" (CL2)

Analogous passages

CP2:1 paras 1-2 (Introduction)

Phenomenon
Industrial robots working alongside humans on an assembly line

P: ment C: Comparison
look as if they could perform many of the same tasks as

[Modal] Token P: rel Value
people. In fact, most industrial robots are about as

dextrous as a human who is blind and deaf, lacks a sense of

touch, and has one hand tied down while working with a pair of

Token P:rel Value C: Reason
chopsticks. Robots are useful only because they position

themselves accurately, ready to receive components at precisely

Range
determined positions from elaborate feeders. Most of the

C: mat C: "Place"
investment in a robot is spent on engineering its working area

C: Contrast
rather than on the machine.

Range P: mat C: Reason
Much of the inherent flexibility of a robot is wasted because

Senser
it executes only a programmed sequence of motions. Researchers

P: ment Phenomenon
all over the world want to free robots from this

Senser P: ment Phenomenon
constraint. They want to equip the machines with multi-

fingered hands, provide them with a sense of touch and allow

Actor
them to measure and control forces precisely. The most

P: mat C: "Place"
dramatic advances in robotics may come from providing robots

Actor
with a sense of sight. The ability to interpret images taken

P: mat Range C: Result
by a television camera would enable a robot to work more like a

C: Quality
human, picking up pieces from any position or orientation,

performing visual inspections and recovering from inevitable

accidents or errors without help.

CL2:1 para 1 (Introduction)

Value P: rel Token
A fundamental capability of human vision is the ability to

robustly recognize objects from partial and locally ambiguous

C: Comparison
data. As with most problems of interest to artificial

Range P: mat
intelligence, this high level of performance is achieved

C: Means
through the use of large amounts of domain-specific knowledge,

in this case regarding visual appearance of objects and their

Phenom P: mental C: Purpose
components. Methods are known for representing information

regarding visual appearance in a computer with a high degree of

C: Comparison
fidelity, as has been shown by the success of computer graphics

[Text]
in generating realistic images of natural scenes. However,

Token P: rel Value C: Accomp
this knowledge itself is of little use without effective

methods for applying the constraints implicit in the knowledge

during the recognition process.

CP2:2 . 4-7 (Human Vision)

Actor
The ease with which people perform common visual tasks -- such

as raising our eyes from a page and immediately recognising the

P: "mat" Goal C: "Place"
objects in our surroundings -- could mislead us into

[Mod]
believing that perception is simple and straightforward. In

Token P: rel Value
fact, human vision involves a large number of highly

specialised modules in the brain that have developed during a

C: Accompaniment
long period of biological evolution. In addition to this

Actor P: mat Range
biological heritage, each person accumulates prodigious amounts

of information about the look of common objects.

Value
One reason why it is difficult to recognise objects visually

P:rel Token
is that any object has an infinite number of different

images, depending on variables such as viewpoint and the

[Text]
position and characteristics of the light source. In addition,

Carrier P: rel Attrib C: Result
parts of the object may be hidden, so we must be able to

[Modal] Sens P:ment
recognise something partially in view. Fortunately we know

Phenomenon Senser P:-
that these difficulties are not insurmountable. We can

C: Freq -ment Phen C: Place C: Quality
usually recognise objects from arbitrary viewpoints rapidly and

[Modal] C: Condition [Dir]
accurately. In fact, if it were not for human vision, it

P: rel Value Token
is unlikely that anyone would consider solving the problem

of visual recognition with a computer.

C: Reason [Dir]
Because human vision motivates our study of machine vision, it

P: rel Value Token
is only natural that we should look to biology for ideas to

[Modal] Token P:- C: Temporal -rel
accomplish this task. Fortunately, vision has long been

Value
a major subject of psychological and neurophysiological

C: Concession Senser P:ment
research. Although our knowledge is incomplete, we know

Phenomenon C: Comp
possibly more about the structure of the visual system than any

other component of the human brain.

[Dir] P:rel Value Token
It is far from obvious how the brain compares knowledge

Value P:rel Token
of an object's shape to its image. A basic problem is that

every viewpoint of a three-dimensional object results in a

[Text] Phenomenon
different two-dimensional image. For example, many objects

P: ment C: Quality C: Place
look entirely different from the back compared with the

[Dir] P: ex C: Freq Existent
front. There is seldom a single feature, visible from all

[Text] Act
viewpoints, that identifies an object. On the other hand, an

P: mat C: Quality C: "Accomp"
object's appearance does not change drastically with every

[Modal] Actor P:mat C:Qual
small change in viewpoint. In fact, many features stay much

C: Place Actor
the same from a wide range of viewpoints. Such stable features

in an image and combinations of different, stable features

P: mat Range C: Place
identify a particular object from all possible viewpoints.

CP2:2 (cont) para 14 (Viewpoint consistency constraint)

C: Time Possessor P: rel Possessed
Before we recognise an object we have no idea of the

[Text] Senser P:
viewpoint from which we will see its image. However, we do

ment Phenomenon
know that each object in any image will be seen from one

particular viewpoint, which provides a powerful constraint on

[Text]
the possible locations of the object's features. To put this

C: Condition
another way; if we use some of the image's features to

[Text] Token
determine the viewpoint, then the object's other features

P: rel Value Token
must be consistent with that viewpoint. Any initial matches

between edges in the image and edges of the computer's model

P:rel Value C: Result
are only partially reliable, so it produces as many other

close matches as possible to confirm its initial matches.

CL2:2 paras 2-3 (Human vision; cf also para 1 above/
Viewpoint consistency constraint)

C: Place Actor P: mat Range
In this paper, we examine one of the central constraints

provided by the prior three-dimensional knowledge, which allows

us to relate the three-dimensional structure of an object and

its components to the two-dimensional spatial structure of its

C: Comparison
projection in an image. As in other areas of artificial

Actor
intelligence, the effective application of such a strong

P:mat C: "Place"
constraint leads, not only to increased robustness, but also to

a large reduction in the search space that must be explored

Verbiage
during the process of interpretation. The particular

P: verb C: Means
constraint that we will be examining can be stated as follows:

> The viewpoint consistency constraint: The locations of all projected model features in an image must be consistent with projection from a single viewpoint.

Carrier P:rel Attrib Token
The ease of stating this constraint is deceptive. The

P: rel
mathematical and practical problems of implementing it have

Value
been such that few model-based vision systems have made full

Senser P: ment Phenomenon
use of the constraint. Some systems have ignored it

C: Qual C: "Time"
altogether while others have used loose approximations that

[Text]
discard much of the inherent information content. However,

Verbiage
the importance of this constraint for achieving robust

P:- C: Qual -verb + Sayer P: verbal
recognition can hardly be overstated, and we will argue

Verbiage
that it plays a central role in most instances of human visual

C: Reason
recognition. Since the appearance of a three-dimensional

object can change completely as it is projected from different

Token
viewpoints, any attempt to recognize an object without

P: rel
application of the viewpoint consistency constraint will end up

Value
ignoring most of the constraining aspects of an object's

Carrier P: rel Attribute
spatial structure. Low-level vision has proved unsuccessful at

generating stable, unambiguous features that themselves provide

[Text] Act
relaiable discrimination between object classes. However, low-

P: mat Range
level vision provides not only the identity of features, such

as edges, but also accurate information regarding their

[Dir] P: rel Token
location in the image. It is this large quantity of

Value
accurate spatial information that can be exploited through

application of the viewpoint consistency constraint.

Actor P: "mat" C:"Place"
A second area of bottom-up image analysis has focused upon

C: Time
region description, making use of properties such as color and

+ C: Freq C: "Place" Token
texture. But once again, in themselves these region

P:rel [Modal] Value C: Accompaniment
descriptions are likely to be of little use without a

spatial mapping of the object model to the image that specifies

which regions are in correspondence to specific surfaces of the

[Text] Token P:rel C: Freq Value
object. Thus, spatial correspondence is often pre-

requisite to other forms of visual matching that are not

explicitly spatial themselves.

CP2:3 paras 8-9 (Detection of "edges")

Value
The simplest example of the identification of stable features

P:rel Token Phen P: ment C:
is the detection of "edges" in an image. Edges appear in

Place Actor
an image where the light changes intensity suddenly. They

P:mat C: Place
occur at the boundary between an object and its background, at

sudden changes in surface orientation or where pigment marks

Carrier P:rel Attrib C: Place
the surface of an object. Edges remain visible over a wide

C: Result
range of different lighting conditions so they counter the

Actor
effects of changing illumination. Studies of the early stages

P:mat Range
of visual processing in the brain show that human vision also

exploits the change in the intensity of reflected light at an

edge rather than the light reflected from each side of the

Possessor
edge. None of the numerous computational techniques to detect

P:rel Poss-
changes in intensity and form edge-like structures had a very

-essed C: Comparison
impressive performance compared with people's ability to

[Text] Token
identify edges in a photograph. Nevertheless, the detection of

P:rel Value
edges is the most common method to identify an initial set

of features in an image for analysis.

C: Concession
While the detection of edges has been around since the earliest

[Dir] P:ex Existent
days of computer vision, there is little agreement on how to

Actor
proceed to form edges into more complex structures. Human

P:mat Range C: Matter [Dir]
vision gives some important clues about what to do (see Box,

C: Reason
p54), because it forms spontaneous groups of edge segments to

Actor P: mat Range
identify known objects. A computer can apply the same methods

C: Result
to form groups and match them tentatively against models of an

object in its memory.

CL2:3 para 7 (Detection of edges)

2.1 Roberts

Possessor P: rel
The seminal work of Roberts [22] in the early 1960s contained

Possessed
many of the important components of spatial interpretation.

Actor P: mat C: Accomp
His vision system began with the detection of edges from a

gray-scale image, from which he attempted to form junctions and

Senser
a graph of connectivities between segments. The interpretation

P: ment Phenomenon
process assumed a domain of rectangular objects, wedges, and

C: Means
pyramids. Based on topological correspondences between parts

Phenomenon
of the objects and the connectivity graph, sets of matches

P:ment C: Place
were hypothesized between points in the image and points on the

Senser P:ment
object. His method for performing spatial verification assumed

Phenomenon + P:mat Range
a particular class of objects and required seven hypothesized

point-to-point matches, which could be used to solve for view-

Carrier
point and internal size parameters of the models. The

P:rel Attribute + Range
resulting solution was overconstrained and the mean-square

P: mat C: Purpose C: Conc
error was used to determine acceptance of the match. Although

Possessor P:rel
specialized to restricted domain of models, these methods had

Possessed
many of the robustness properties necessary for the

[Dir] P:rel Attrib Carr
interpretation of real images. It is unfortunate that

this work was poorly incorporated in much subsequent computer

vision research.

CP2:4 para 13 (Problem of flexibility)

[Text] Actor P: "mat" Range
Of course, a single rigid model does not capture the potential

Possessor
variations in the appearance of many common objects. Many

P:rel Possessed [Text] Possessor
objects have parts that move or bend. In addition, an object

P:rel Possessed C: Comp
may not have exactly the same measurements and shape as any

C: Concession
previously encountered, yet we recognise it because it

Actor
resembles a "generic" class of objects. Some vision systems

P: "mat" Goal C: Time
can manipulate such generic models. As computer vision matures

Carr P:rel Attrib
it will become able to recognise objects by their surface

properties, such as colour and texture, in addition to edges.

C: Time Actor P:mat Range
When this occurs, robots will need the more sophisticated

C: Purpose
modelling techniques of computer graphics to represent these

more complex visual properties.

CL2:4 para 4 (Problem of flexibility)

Value
One argument that is sometimes advanced against the use of

P:rel Token
precise spatial correspondence is that many objects are

nonrigid with internal degrees of freedom and variable

[Dir] P:rel [Text] Attrib Carrier
dimensions. It is also clear that human vision has a

remarkable capability for recognizing distorted images and

[Text] Range P:mat C: "Place"
drawings. However, advances will be made on these important

C: Means
problems only by explicitly representing the possible degrees

of freedom and distortions that are present in a situation.

Possessor P: rel
Our knowledge of the visual appearance of objects includes

Possessed
a large amount of information on internal degrees of freedom in

C: Accompaniment
their shape and visual properties, as well as potential

Token
transformations in the image domain itself. To simply discard

all of the available spatial information because some of it is

P: rel Value
not fully constrained would result in the loss of a large

[Dir] P: rel Attr
portion of our most useful visual knowledge. It is true,

[Text] Carrier
for example, that human vision can identify a person from a
C: Concession
highly nonveridical cartoon drawing, yet any amateur artist
knows that this is an entirely different proposition from
stating that recognition could occur after arbitrary spatial
transformations of the image.

CP2:5 paras 15-17 (Recognition process)

Value P: rel Token
The first step in recognition is to find a promising
correspondence between a few features of the image and a few
[Modal] [Dir] P:rel Attrib
features of the object. Unfortunately it is math-
Carrier
ematically difficult to define an object's position and
orientation from the locations of some of its edges in a two-
Carrier P:rel Attrib + Possessor
dimensional image. The equations are nonlinear and they
P:rel Possessed Actor [Text]
have no straightforward solution. The computer, therefore,
P:mat Range
needs to adopt numerical methods that reach a solution through
Value
several iterations towards the best answer. The mathematical
P:rel Token
technique we adopted at New York University is Newton's
method which Sir Isaac Newton developed in the 17th century.
Actor P:mat C: Accompaniment
The method starts with a rough guess of an object's position
+ [Text] P: mat Range
and then measures the errors between the position, which has
Actor
been guessed, and the edges in an image. Newton's method

P: mat Range
calculates simultaneous adjustments to the six parameters that

specify position and orientation in three dimensions and

minimises errors in the guess.

C: Time Actor P: mat Goal
Once the computer finds the viewpoint, it projects its model

C: Place + P: verb
of the object onto the image from this viewpoint, and predicts

Verbiage C: Time
new matches. As the computer finds new matches between edges,

Actor P: mat Range C: Purpose
it adjusts its estimate of the viewpoint to take the new

Actor P: mat C: Time
information into account. The process ceases when no more

C: Condition
matches are left. If the object is truly present at that

[Text] Senser P: ment Phenomenon
position, then we can expect a large number of matches.

C: Condition [Text] [Dir] P:rel Attrib Carr
If the object is not present, then it is unlikely that

more than a few matches will be consistent with the initial

C: Conditon
estimate of the viewpoint. Even if parts of an object are

hidden behind other objects or if poor light obscures edges,

[Dir] P:- [Modal] ex Existent C: Purpose
there will likely be enough correct matches to confirm the

object's position.

C: Time Senser P: ment Phen
Each time the computer locates an object, it remembers the

+ P: mat Goal
object's position and orientation and removes all of the edges

C: Place C: Time
in the image that match edges in the model. As the computer

[Text]
defines more and more objects in a bin of parts, for example,

Token P:rel Value
the number of remaining edges in the image become fewer and the

"Actor" P: mat "Actor" P:mat C: Time
search area decreases. The search ends after a fixed time.

C: Freq Actor P: mat C: Time
Usually, many uninterpreted edges remain at the end of this

C: Reason
period because they are not part of a model or because so

little of an object is visible that it would require too much

computation to identify.

CL2:5 paras 30-32 (Recognition process)

Token P:rel Value
The viewpoint consistency constraint is of little use for

C: Reason
the initial stages of matching. Since we initially may have no

idea of the viewpoint from which we will be viewing an object

and may have a library containing large numbers of possible

Senser P: ment
objects, the initial bottom-up stages of vision must detect

Phenomenon
features that are at least partially invariant with respect to

[Modal]
viewpoint and are independent of any specific object. In fact,

Possessor P: rel Possessed
human vision does have such "perceptual organization"

capabilities for detecting bottom-up viewpoint-independent

Actor P: mat C:
structure in the image. The SCERPO vision system begins by

Means Actor P: mat
using established methods for edge detection. Figure 4 shows

Range
an image of a bin of disposable razors taken at a resolution of

Phenomenon
512 x 512 pixels by an inexpensive vidicon camera. Edges

P: ment C: Place C: Means
are detected in this image by finding zero crossings of a ^2G

Phenomenon P: ment C: Place
convolution [20]. Straight line segments are detected from

C: Means
these edge points using a scale-invariant segmentation

C: Result
algorithm, producing the set of segments shown in figure 5.

[Text] Range P: mat Attribute
Then a grouping process is executed that detects significant

instances of colinearity, endpoint proximity, and parallelism

Token
from among these segments. The methods for perceptual

P: rel Value + Range
organization are beyond the scope of this paper, and the

P: mat C: Place C: Reason
reader is referred to previous papers [16-18] for a discussion

of the derivation and implementation of these grouping
Goal P: mat C: Means C: Place
properties. The groupings are matched one at a time to

components of the object model that are expected to give rise

C: Means Range
to that type of grouping in the image. In this way, the

P: mat C: Purpose
groupings are used to provide hypothesized matches to trigger

the application of the viewpoint consistency constraint.

5.1 Examples of Viewpoint Consistency Analysis

Carrier
Matches between an object and the image that are based simply

P:- [Modal] -rel
upon viewpoint-invariant properties will necessarily be

Attribute Actor P:- C: Qual
unreliable. The viewpoint consistency constraint can greatly

-mat Range C: Means
improve reliability by taking tentative matches between a few

image features and object features, solving for a consistent

viewpoint, extending the match by predicting the locations of

Actor P: mat Range
other model features, and iterating. Figure 6 shows this

sequence of operations in extending the match for a successful

instance of binding.

Actor P: mat Range
Figure 6a shows an initial grouping of four image segments

(shown in bright blue) that was produced during the perceptual

Phenomenon P: "ment" Senser
grouping process. The grouping satisfies a skewed symmetry

+ [Text] P: mat C: Place
relation and therefore is matched to bilaterally symmetric

C: Time Actor
edges on the object during the search procedure. The remainder

P: "mat" Range C: Place
of figure 6 follows one of these tentative matches to its

Range
successful conclusion. The initial viewpoint estimate for the

P: mat C: Means
model (shown in figure 6a in dark blue) is made by using simple

Goal P:- [Text] -mat C: Comparison
linear approximations. This is then refined as shown in

C: Means
figure 6b by two iterations of Newton's method (shown in dark

C: Result
blue), producing a least-squares viewpoint estimate (shown in

red).

CL2:5 (cont) para 35 (Successful conclusion of process)

C: Time Goal P:
As each successful match is found, the identified segments are

mat C: Role + P:- C: Time -ment C: Purp
marked as already matched and are no longer considered for

[Text] Actor [Modal]
further matching. Therefore the search space actually

P: mat C: Time
decreases as more and more of the segments in the image are

Range
removed from consideration. The final results of this process

P: mat C: Place
are shown in figure 8, in which five viewpoints of the model

(shown in red) were found to be in close agreement with subsets

C: Place
of the original image segments (shown in blue). In each case

Range P: mat
of successful recognition, more than 15 image segments were

C: Place C: Reason
matched to the model. Since only about three segments are

Actor
needed to determine viewpoint, all the remaining matches

P: mat Range
provide confirmation for the presence of the object at that

[Text] Possessor P: rel Possessed
location. Therefore, we can have very reliable

C: Concession
identification in spite of partial occlusion and other forms of

Actor
missing low-level information predicted by the model. Figure 9

P: mat Range Attribute
shows the model projected onto the image from the final

Range P: mat Attrib
calculated viewpoints. Each edge in this image is drawn solid

C: Place + P: mat
where there is a matching image segment and is dotted

C: Place Token
elsewhere. The total computation time expended on this example

P:rel Value C: Place + Goal P:- [Modal] -mat
was about 3 min on a VAX 11/785, but it could probably be

C: Quality C: Condition
speeded up by a large factor if speed were a major objective.

Carrier P:rel Attrib
All of the code beyond the edge detection stage is written

in Franz LISP.

CP2:6 para 18 (Conclusion)

[Dir] P: rel Value Token
It may be a few years before these particular methods of

machine vision are applied to robots in factories or other

\+ [Dir] P: ex Existent
places of work. But there is little doubt that machine

vision will have a major impact on the ability of robots to

perform tasks away from the structure of a production line.

Token P:rel C: Time Value
More primitive forms of computer vision are already in daily

Token P: rel Value
use in industry. Vision is the most important of the human

\+ Actor P: "mat" Range C: Behalf
senses and it will play a similarly important role for the

C: Quality
computer in gathering information about its environment.

CL2:6 paras 36-37 (Conclusions)

Actor C: Quality
Application of the viewpoint consistency constraint greatly

P: mat Goal C: Means
simplifies the recognition problem by providing quantitative

constraints on the locations of object features in the image.

Carrier P:rel Attribute
This constraint is strong enough that it can change the

Actor
basic framework within which recognition is performed. Bottom-

P:- C: Time -mat C: Accompaniment +
up processing need no longer function with high reliability or

P: mat Range
provide complete representations of physical properties of the

[Text] Range P: "mat"
scene. Instead, the bottom-up description of an image is aimed

C: "Place"
at producing viewpoint-invariant groupings of image features

that can be judged unlikely to be accidental in origin, even in

the absence of specific information regarding which objects may

Range P: mat C: Purpose
be present. These groupings are not used for final

\+ [Text] P: mat C: Role
identification of objects, but rather serve as "trigger

C: Purpose
features" to reduce the amount of search that would otherwise

Range P: mat C: "Place"
be required. Actual identification is based upon the full use

\+ P: mat Range
of the viewpoint consistency constraint, and maps the object-

C: Place C: Accompaniment
level data right back to the image level without any need for

the intervening grouping constructs.

Range P: mat C:"Place"
The matching process presented in this paper is based upon a

probabilistic analysis of the likelihood that each potential

Token P: rel Value
match is correct. This approach contrasts with the more

traditional use of preset error thresholds during matching,

which accept any match that is within a range that could be

Range
accounted for by noise or modeling inaccuracies. The

P: mat C:
individual probabilistic analysis of each match can be used to

Purpose + [Text] P: mat C: Place
decrease ambiguity greatly and therefore leads to a much

C: Comparison
smaller search space than would otherwise need to be explored.

[Dir] P:rel Value Token
It is likely that these same methods could be applied to

many other components of the recognition problem.

Field: Computing, No.3
Popular article: "Computing in parallel" (CP3).
Learned article: "Implementing Neural Network Models on Parallel Computers" (CL3)

Analogous passages

CP3:1 para 1 (Introduction)

C: Condition P:-
If it takes one woman nine months to produce a baby, shouldn't

Actor -mat Range C: Temporal Range
nine women be able to do the job in one month? Some tasks

P: mat C: Quality C: Means C:Comp
cannot be performed more quickly by sharing out the work, as

the designers of the new parallel computers are finding.

C: Freq [Text] [Dir] P:rel Token
Sometimes, however it is only a question of finding the

appropriate design for the task.

Possessor P: rel Possessed + P: mat
Conventional computers contain only one processor and can do

Range C: Freq [Dir] P:ex Existent
only one thing at a time. There are fundamental physical

limits to the speeds at which a single processor can operate.

C: Purpose Actor P: mat
For practical purposes, today's most advanced processors are

Range Possessor [Text]
approaching these limits. A parallel computer, on the other

P: rel Possessed [Dir] P:ex
hand, contains many processors working in parallel. There is

Existent
no limit to the number of processors which a single computer

C: Result
can contain, so there is in theory no limit to the speed at

\+ Carrier
which a single computer could operate. And parallel computers

P: rel Attribute C: Reason
are potentially more reliable, because the failure of a

single processor in a computer containing several thousands is

Carrier P:rel Attribute C: "Place"
not critical. This reliability is very attractive in

applications such as guiding aircraft and the control of

processes in industry.

C: Condition
If parallel computers help to satisfy the demand for speed and

[Text] Actor P:mat Range
reliability, however, they create new problems of their own.

Carrier P: rel
Many of the techniques used on conventional computers turn out

Attribute + Actor
to be slow and inefficient on parallel machines, and parallel

[Text] P: mat Range
programs often encounter the "nine women, one month, one baby"

paradox, in which the availability of more workers does not

\+ Token P: rel
accelerate the work. But many of these difficulties are

Value C: Comp
a reflection of the newness of parallel programming rather than

[Dir] P:ex C: Time Existent
inherent problems. There are already a number of different

approaches to the design of parallel systems.

CL3:1 para 1-2 (Introduction)

C: Place Sayer P: verb Verbiage
In this paper we describe recent work at Edinburgh

investigating a range of neural network models using existing

Token P:rel Value
parallel computing facilities. This work is part of a wider

research effort in applications of parallel computing which

spans molecular dynamics, phase transitions, and critical

phenomena, lattice gauge theories of elementary particle

interactions, fluid dynamics, electronic structure
calculations, optimisation problems, image enhancement, protein
Token P:rel
crystallography and protein sequence analysis. This last is
Value C: Time
the subject of another article in this issue. Following early
exploitation of the ICL Distributed Array Processor at Queen
Range P: mat C:
Mary College, this multidisciplinary work has been sustained by
Means
the acquisition of two DAPs in 1982, the first with SERC
support and a software agreement between ICL and the Edinburgh
C:
Regional Computing Centre, the second as a gift from ICL. More
Time Ben P: mat Range
recently (March 1986), we received Department of Trade and
C: Purpose
Industry support to purchase a Meiko Computing Surface, a
Range
reconfigurable array of Inmos transputers. Reviews and
P: mat C: Place
references to the work on these machines are given in Refs 1
and 2.

Token P:rel Value Actor P: mat
The structure of this paper is as follows. We begin
C: Means
with a brief review of the hardware and software
characteristics of the DAP and transputer arrays such as the
Actor P: mat Range
Computing Surface. Section 3 gives an overview of the main
+
characteristics of the more common neural network models and
P: verb Verbiage
discusses the general strategies which we have used in

Verbiage P: verb
implementing them on these machines. Specific examples are

C: Place C: Place Sayer P: verb Verbiage
discussed in section 4. In section 5 we summarise the

conclusions from the work to date.

CP3:2 paras 4-6 (Types of parallel processor)

Actor P: mat Goal C: "Place"
We can divide parallel processors into two main types: those

that carry out one operation on many different objects at once;

and those that divide large programs into many smaller ones

Phen
which separate processors can carry out simultaneously. The

P: ment C: Role + Phen C:
first are known as parallel-data computers, and the second as

Role
parallel-process computers.

C: Place Actor
In the parallel-data computer, all the processors

C: Time P: mat Range C: Place
simultaneousy carry out the same task on different parts of

[Text] C: Condition
the data. For example, if a parallel data computer had to

calculate

$$d = \sqrt{x^2 + y^2 + z^2}$$

Actor P: mat Goal
for many different objects, it would store the coordinates

C: Place Actor P:-
for each object in a separate processor. Each processor would

[Text] -mat Range C: Matter C: Means
then square, sum and take a root for its own values. In this

Actor P: mat Range C:
way, a parallel-data computer could produce as many results as

Comparisons C: Temporal
it had processors in the same time that a conventional computer

would take to produce a single result.

C: Place   Possessor   P: rel Possessed
In a parallel-process computer, each processor has   its own

                                         Carr P: rel Attrib
programs to carry out. This may be quite different from the

                                                                  [Text]   C: Cond
programs that its neighbours are running. For example, if the

                                                                          Actor   P:mat
computer were running a flight simulator, some processors would

Range   C: Purpose
run programs to calculate simulated features, such as aircraft

                    C: "Time"
lift and drag, while others would display the view from the

cockpit, or interpret the user's commands.

CL3:2   paras 6-10 (Types of parallel processor)

2.1 Parallel processor architectures

[Dir] P:ex Existent
There are two basic parallel processor architectures, denoted

                    Actor
SIMD and MIMD. SIMD (Single Instruction Multiple Data)

              P: mat   Range   C: Place   C:
computers execute the same instruction on every processor at

Time   C: Means   C: Place
the same time, each applying it to their own data. In an MIMD

                                                                         Actor
(Multiple Instruction Multiple Data) computer each processor

P: mat Range   C: Means
runs   its own program acting on its own data.

C: Purpose   Actor
In order to cooperate on solving a single problem the

               P: mat   Range   Poss-
processors must be able to communicate with each other. SIMD

essor   C: Freq P:rel Possessed   C: Place
machines usually have direct serial connections between each

processor and its neighbours.

[Dir] P:ex Existent
There are two approaches to the problem of inter-processor

communication in MIMD machines: (i) buses, and (ii) point-to-

pont connection networks.

C: Place Sayer
Bus-based machines. In a bus-based machine all the processors

P: verbal Receiver C: Means
communicate with each other, or with all the memories, via a

Token P: rel Value
bus -- a high-bandwidth data path. The bus must be fast enough

\+ P: rel
to service all the processors and memories, and must contain

Possessed C: Reason
arbitration logic to prevent more than one processor attempting

Token
to write to a given memory location at the same time. The BBN

P: rel Value
Butterfly Computer is such a machine.

Value P:rel
Processor networks. A simpler model of parallel processing is

Token
that each processor should have its own memory, and should

communicate with a small number of other processors via point-

Goal
to-point links. Data in the memory of one processor that is

P: mat C: Place
required by another must be passed between them along the

Token
communications links. The Intel Hypercube, Ncube and Meiko

P:rel Value
Computing Surface are examples of this type of machine.

CP3:3 para 7 (DAP)

Range P:- C:Time -mat
Parallel computers of both types are now being manufactured

C: Place Token P:rel
in Britain. The Distributed Array Processor, or DAP, is

Value
a parallel-data computer, first developed by the largest

\+ C:Time P: mat
manufacturer of computers in Britain, ICL, and now made

Actor Token
by a spin-off company called Active Memory Technology. The DAP

P:rel Value
is a specialist computer system which is connected to a

Possessor P: rel Possessed
"host" computer. Each DAP contains 1024 small processors --

called processing elements because, unlike true processors,

Goal P:
they cannot function on their own. The processing elements are

mat C: Place
arranged on a square grid under the control of a master

[Dir]
processor (see Figures 1 and 2).

CL3:3 para 11-12 (DAP)

2.1.1 The Distributed Array Processor

Token P:rel Value
The DAP, Ref 3, is a 2-D grid of 4096 processor elements

(PEs), each having 4 or 16 Kbits of local memory, and North,

[Dir P:ex
South, East and West connections to its neighbours. (There are

Text Existent] Actor P: mat Range
also row and column broadcast functions.) All PEs obey the

C: Means
same instruction at the same time, applying it to local data.

Dir
(See Figure 1.)

Carrier P:rel Attribute
The DAP is programmed in DAP-FORTRAN, an extension of

[Txt]
FORTRAN-IV which incorporates array and vector constructs. For

C: Condition [Text] Actor
example, if A, B and C are 64 by 64 matrices then A = B*C

P: mat Range C: Place C: Time
will produce $A_{ij} = B_{ij}*C_{ij}$ on all 4096 PEs simultaneously.

Actor P: mat Ben Range
A masking facility allows us to select which of the processors

we require the result on.

CP3:4 para 13-15 (Computer graphics/Image restoration)

Carrier P:rel C: Qual Attrib C: Time +
Transputers have been generally available only since 1985, but

Possessor C: Time P: Poss Poss'd Token P:rel
they already have many uses. One such application is

C: Place
in computer graphics, where a technique called "ray tracing"

Range P: mat C: Means
can create realistic images. The images are built up by

shining an imaginary beam of light through each point on the

C: Condition
screen to reveal objects "behind" the screen. If there is an

Carrier P: rel Attribute C:
object there, the point takes on the colour of the object. If

Condition Actor P: mat
the object is reflective or transparent, the system generates

Range C: Purpose Value
more rays to create the objects reflected at that point. One

P:rel Token C: Comp
application of ray tracing is interior design. Instead of

Actor P:- C: Accomp -mat
building a model, a designer can, with ray tracing, create

Range C: Purpose
a realistic image to show a client.

[Text] Actor P: mat Range
Initially, the program assigns a small section of the image

C: Place
to "master transputers", which allocate sections to "worker"

Actor P: mat Range
transputers. They calculate a value for each point in their

[Text] P: mat Range + P: mat Range
section, then receive another section and work on that.

Actor P: mat Goal C: Time
The transputers process sections until they have completed the

Actor P: mat C: Quality C: Accompaniment
image. Each transputer can work at full speed without being

Value
slowed down by its neighbours. An added advantage of this sort

P:rel Token
of decentralised processing is that work is automatically

distributed among available processors more or less evenly.

Carrier P: rel Attribute
This sort of calculation is not well suited to the DAP

C: Reason
because the amount of calculation to be done can differ widely

C: Reason
from point to point. Because the DAP's processing elements

Actor
must all carry out the same instructions at the same time, the

P: mat Goal C: Quality C:Comp
DAP could not process a group of points any more quickly than

Value
it could process the slowest point in that group. One of the

P:rel Token
changes AMT made in the DAP was the inclusion of a high

bandwidth bus for getting data to and from the processors

C: Means Actor P: mat Range
quickly. Using this, DAPs can carry out some of the more

C: Qual Actor
concentrated algorithms for graphics quickly. These

[Text] P: mat Range
conventional algorithms, however, produce images that are not
as "nice", that is, realistic, believable and detailed, as the
Actor P:mat Range
images which ray tracing produces. You can do ray tracing
C: Place + Carrier P:rel Attribute
on a DAP, but it is slow.

Token P:rel Value C: "Place"
The transputer is best at the sort of problem that can be
broken down into several independent "subproblems" which can be
Possessor P: rel
solved simultaneously. Applications under development include
Possessed
computer graphics, simulation of fluid dynamics and a chess
program which achieves high speeds by searching many different
possible positions at the board at once.

CL3:4 paras 45-51 (Computer graphics/Image restoration)

4.3 The Geman and Geman algorithm

Goal P: mat
The image restoration algorithm of Geman and Geman[22] is applied
C: Place Token
to binary images which have been corrupted by noise. The
scheme employed for optimising the corresponding cost function
P: rel Value
involves representing the array of pixel intensities as a
network of neurons, each of which can 'fire' on a continuous
scale from non-firing ('black' pixel) to fully firing ('white'
Carrier P:rel Attribute
pixel). The parameters of the cost function are embedded in
the connection strengths between neurons and in the individual
Range P: mat C: Qual
thresholds of the neurons. Solutions are found quickly:

C: Means
starting from a state corresponding to the observed (noisy)

Actor P: mat C: Temporal
image, the network settles in a few characterisitic time-steps

C: "Place" Carrier
into a state which minimises the cost-function. The connection

P: rel Attrib
strengths are local, involving only a neuron and its immediate

neighbours.

Actor P: mat Goal C: Place
We have implemented the evolution of this network on the DAP

C: Means
and on the DAP[23] and on the Computing Surface using the

analogue neuron method of Hopfield and Tank[24].

4.3.1 Geman and Geman on the DAP

Goal P: mat C: Place C: Means
The algorithm was applied to square images, assigning neurons

to pixels with connections between each neuron and its nearest

neighbours (the pixels to the north, south, east and west).

C: Reporter Goal
As pointed out in Ref.25, the state of half of the neurons

P: mat C: Quality C: Behalf
may be updated in parallel for this choice of neighbourhood

C: Reason
system since the new state of each pixel (neuron) depends only

Goal
on the state of its four neighbours. The other half of the

P:- [Text] -P- C: Time -mat C: Purpose
pixels may then be simultaneously updated, so that one

complete sweep of the image is achieved in two synchronous

updates.

Range P; mat C: Means
This parallelism was exploited by numerically simulating the

dynamical neural network on the DAP, assigning one neuron to

C: Matter Token

each processor. For 64 x 64 images the rate of updating on the

P:rel Value Carrier

DAP was more than 100 sweeps per second. Between 1000 and 3000 sweeps (equivalent to between 1 and 3 neuron time

P:rel Attrib C: Purpose

constants) were necessary to restore a typical image.

Token

The performance of the restoration by this analogue neural

P: rel Value

network method was compared to that of a simple majority-rule scheme (where each neuron continually adopts the intensity of its four nearest neighbours, or remains unchanged if exactly two of its neighbours are 'white', until the image stabilises).

Range P: mat C: Means

A third restoration method, performing a gradient descent, was achieved by restricting the neuron firing rates to discrete

Actor

values ('on'/'off'). The analogue neural network method

C: Quality P: mat Range

consistently finds lower-cost solutions than these schemes.

[Sayer P: verb Verbiage

(Murray et al[25] report similar updating speeds and results using the simulated annealing algorithm[26].)]

4.3.2 Geman and Geman on the Computing Surface

Actor P:mat Range C: Place C: Means

We implement the algorithm on the Computing Surface by splitting the picture into bands and allocating one band to each processor, the processors being connected in a chain.

Range P: mat C: Means
The update is performed thus

```
PROC Update()
 SEQ
 PAR
 ...update internal neurons
 ...transfer boundary data
...update boundary neurons
```

C: Purpose
To update neurons on the edge of the band assigned to one

Actor P: mat Range C: Place Actor P: mat Goal
processor we need data from the next; we transfer this

C: Time
data while updating the neurons in the centre of the band.

C: Time Actor P: mat Goal
When both of these tasks are complete we update the neurons

C: Place
in the boundary.

Actor P: mat Range
The implementation on the Computing Surface uses 40

C: Purpose
processors to restore 256 x 256 (or smaller) images.

Goal P: mat C: Place
Information on the state of each neuron is sent to the graphics

processor, where it is used to generate a display of the

Token
current image. The cost of splitting processing between many

P: rel Value C: Reason
processors is low because communications and

calculations can be overlapped.

CP3:5 paras 17-18 (Conclusions)

Token P: rel Value
The DAP and the transputer are just two examples of new

Token P: rel
parallel computers. Many other variations on the theme are

Value C: Place Possessor C: Time P: rel
under development around the world. We still have

Possessed
a lot to learn about just what we can and cannot do using

parallel computers of various designs.

[Dir] P: rel Token
It may seem that the main aim of designing parallel computers

[Text] Value
is merely to produce faster machines. Yet the real

P:rel Token
objective is to give people the power to solve problems that

Actor
were once impossibly difficult. Progress in the design of

P: mat Range Attribute
parallel computers will make this power available to many more

users.

CL3:5 paras 52-53 (Conclusions)

Carrier P: rel C: Qual
The range of models studied in this paper are all

Attribute + P:- C: Qual -mat
amenable to parallel computing, and can be efficiently mounted

C: Place C: Condition
on a variety of computer architectures, provided that the

C: "Place" Token
problem under study is sufficiently large. In practice this

P: rel [Modal] Value C: Condition
is unlikely to be a major limitation provided that the

software can be made relatively independent of the number of

C: Reason
processors available/required, because 'small' problems can

typically be run in a humanly acceptable time-scale on modestly

[Dir] P:rel Value Token
parallel systems. It is our view that the software

effort expended in the first place to implement these simulations on the hardware described is well justified by the

[Modal] C: "Place" [Dir] P:rel
increase gained in performance; in fact in some cases it is

Value Token
clear that the use of these parallel machines was essential for

the simulations to be done at all in a feasible amount of time.

Token P:rel Value [Text] [Dir] P: rel Value
Two further comments are in order. First it is clear

Token
that there is enormous potential in future developments in

special-purpose silicon design, including analogue circuitry[27],

[Text] Token
and also in optical computing[28]. However, the realisation of

P: rel Value
this potential in real applications is dependent on lots of

C: Result
ideas, analysis and simulation to develop new models which work

[Modal]
effectively and competitively for these applications. In any

C: Place [Dir] P:rel Carr
event, in many of the models studied to date, it is the

C: Comparison Attribute
training rather than the recall mode which is most

C: "Place" Actor
computationally intensive; in such cases, the actual operation

P:- Value -mat Range
of a trained net may not of itself require exceptional

[Text] [Modal
computational resources. Secondly, as all will appreciate who

] Token
have benefited from good interactive graphics facilities, their

P:rel Value
use in neural modelling is invaluable in beginning to

C: "Reporter"
understand the behaviour and performance of a net, particularly

in view of the large volume of data embedded in the connection strengths, and the obvious applications to image enhancement

Carrier

and analysis. The integrated graphics capabilities of the

P:rel Attribute C: Comp

Computing Surface are admirably suited to this task, as we anticipate the new DAP3 system's will be also.

Field: History, No.1
Popular article: "The Seaside Resort and its rise in Victorian and Edwardian England" (HP1)
Learned article: "The Demand for Working-Class Seaside Holidays in Victorian England" (HL1)

Analogous passages

HP1:1 paras 1-3 (Introduction)

Token P: rel Value
Urban history has been one of the most prominent academic

Value P: rel Token
growth areas of the last two decades. So has the

\+ C: Condition
overlapping discipline of social history; and if in both cases

practicioners and outsiders alike have found it difficult to

agree on prescribed boundaries, subject matter, agenda and

Actor P: "mat" Range
approaches, this has reflected the diversity, fertility and

C: Comparison
originality of much of the work, rather than any lack of

Actor
discipline or academic rigour. The richness of the sources,

P:mat
and the exciting evidence of growth, change and conflict, have

Range C: "Place"
attracted particularly eager attention to the nineteenth

C: Accompaniment
century, with its developing controversies about the nature and

significance of urban social change -- and continuity -- in

Actor
relation to urban living standards, culture and politics. The

results of some of this work, applying the developing concepts

and research techniques of social history in an urban setting,

P:- C:Time -"mat" Range C: Place
are now beginning to find their way into textbooks and general

Carrier
interpretations. Recent debates over economy, society and
popular politics in the northern textile towns, and discussions
P: rel
of the social pathology of working-class London, have been
Attribute C: Place
particulary influential here.

Actor [Text] P:- C: Time -mat Range
Much of the new work, however, has yet to make an impact
C: Place Actor
on the textbook and the school examination syllabus. Only P.J.
C: Place
Waller, in his Town, City and Nation: England, 1850-1914
P: mat Range
(Oxford, 1983), provides a readily-available synthesis of a
C:Means
wide range of work in nineteenth-century urban history, in the
form of a lively introductory textbook which views English
Senser
social and political history through an urban lens. Waller
P: ment Phenomenon C: "Place"
pays due attention to several kinds of town which have
attracted extensive recent research, over and above the
metropolis, the seaports and the centres of textile
Senser P: ment Phen
manufacture, mining and heavy industry. He looks at the
experiences of stagnating or subtly changing market towns and
+ Actor P: mat Range
older administrative centres, and he analyses the growth of
residential outer suburbs and specialised leisure towns, two
urban categories with overlapping characteristics which include
some of the fastest-growing urban entities in Victorian and
Edwardian England.

Token P:rel Value
The leisure towns form a particularly attractive and revealing

[Modal] Carr P:rel Attr C: Matter
focus for research. Above all, this is true of the seaside

resort, that characteristically English and (in so many cases)

quintissentially Victorian artefact which proliferated in such

enormous numbers, was 'exported' to so many other countries,

and included such impressive examples of the scale and pace of

Carrier P: rel
nineteenth-century urbanisation. Social historians have been

Attr C: Place C: Time Actor P: mat
busy at the seaside in recent years. Local case studies have

C: Quality + Actor
multiplied, especially in thesis form, and attempts at

P: mat
comparative analysis and general synthesis have begun to

Attribute
emerge, building on the great pioneering work of J.A.R. Pimlott

[Text] P:- Actor -mat Range
nearly 30 years ago. Why have historians found these

centres of frivolity, conspicuous consumption and retirement

Attribute + [Text] P:- Actor -mat
so interesting and important, and what can they contribute

Ben
to our understanding of Victorian and Edwardian society?

HL1:1 para 1 (Introduction)

Token P: rel C: Place
Victorian seaside resorts were among the fastest-growing

C: Time + C: Time
English towns in a period of rapid urbanization; and by the

Actor
later nineteenth century those which were expanding most

P: [Text] -mat Range
spectacularly were also having to come to terms with changing

C: Time
patterns of demand for their services. From the 1870s onwards,

Actor P: "mat" Goal [Txt]
rising living standards released a flood of new visitors. At

Actor P: mat + Tok
first, tradesmen and whitecollar workers predominated, but the

P:rel Value C:Place
skilled worker and his family were strongly in evidence at

[Comment]
many resorts, stimulating the development of new kinds of

retailing and entertainment provision and posing problems of

public order and marketing strategy for those in authority[1].

HP1:2 para 4 (Universality of seaside holidays)

The seaside and social harmony

C: Time Phenomenon P:-
By the end of the nineteenth century the seaside holiday was

C: "Spatial" -ment C: Role
widely seen as a universal English enjoyment, spanning

the classes and bringing people from all walks of life into

harmonious contact in their annual escape from routine drudgery

Actor
and toil. The introduction to a Newnes guide to the coast of

P: "mat" Goal
Britain, a coffee-table book of the 1890s, encapsulates these

feelings:

> C: Means
> It would be almost impossible to find, throughout the length and breadth of our peerless Empire, a solitary individual who is wholly unacquainted with Margate, and Brighton, and Scarborough. We love our haunts by the sea; the poorest among us regards his favourite resort pretty much as the rich man does his country seat -- as a place of relaxation from the hurly-burly of life, and yet a home withal...it would be impossible to place upon the table of a British household a more interesting souvenir of happy days than this volume...how vividly the old associations crowd back to the mind -- memories of glowing, careless days, that

gave new mind to the jaded worker and caused the brain
weary to forget their ineffable taedium vitae.

Carrier P:rel Attrib
This compendium of Victorian commonplaces was misleading,

[Modal] Senser C: Time C: Freq
of course. Many of 'the poorest among us' still never

P: ment Phen + Senser P: ment Phen C: Role
saw the sea; and many others saw it only as very

+ C: Place
occasional day trippers, and in the less cultivated setting of

Possessor
Cleethorpes or Blackpool or Tynemouth. Even the Lancashire

cotton towns, which pioneered the seaside holiday as a mass

P: rel Possessed
experience, contained a significant residue of those who were

[Text]
unable -- or unwilling -- to afford a seaside visit. Moreover,

Carrier P:rel Attrib C: Comp
seaside reality was much less bland and conflict-free than

the sentimentally idealised portrayals of commercial

Actor
commentators might suggest. The ideal of the seaside as refuge

P: mat
and escape from urban pressure and industrial routine coexisted

C: Accomp
with alternative or supplementary conventions which portrayed,

especially in Punch, the discomforts, frustrations, social

embarrassments and disasters which could befall both the

middle-class family and the tripper.

HL1:2 para 18 (Universality of seaside holidays)

Sayer P: verbal Verbiage
All this helps to explain why the seaside holiday habit had

become so deeply rooted in the Lancashire textile district by

C: Time Possessor P: rel
the turn of the century. By the 1890s, whole towns had

Possessed C: Place C: Accompaniment
a deserted appearance at the Wakes, with shops closed and

churches having to join forces to raise even the semblance of a

Actor P: mat +
choir for Sunday service[36]. The fairgrounds persisted, but

Range P: mat C: Freq Actor
they were frequented more by people from the surrounding

C: Comparison Actor
villages than by the townsfolk themselves[37]. The traditional

P:- C: "Spatial" -mat C: Place
amusements of the Wakes had in large measure migrated to the

C: Time +
seaside, as the resorts acquired fairgrounds of their own; and

Actor C: Place
this response to new opportunities, especially at Blackpool,

P:mat Range Attrib C: "Place"
itself made the seaside even more attractive to the less

C: "Place"
"respectable" elements among the working-class[38]. In this

transformation of the customary holidays from communal

Actor
festivity at home to mass exodus to the coast, textile

P:mat Range + [Dir] P:rel Attrib Carrier
Lancashire led the way; but it is noticeable that the

miners, the dockers, the chemical workers and the labourers who

predominated in south-west Lancashire and on Merseyside did

not join the textile and engineering workers in their rush to

C: Place [Dir] P:ex Existent
the sea[39]. Even within Lancashire, there were significant

\+ Token P: rel
variations in working-class leisure patterns, and they seem to

Value
be directly related to variations in family incomes, regularity

of work, labour discipline, the ability to save, and the

C: "Time"
survival of traditional holidays. In examining developments in

Actor P: "mat" Goal
other parts of England, we shall need to bear these

C: Freq C: "Place"
influences constantly in mind.

HP1:3 para 11 (Class conflicts)

Actor P: "mat" C: Place
Class conflict at the seaside revolved around attitudes to

C: Comparison Token P:rel
visitors, rather than wages or working conditions: it was

Value C: Comparison
about styles of spending money, rather than the getting of it.

Actor P: mat C: Means
Most resorts began by catering for the middle and upper

\+ Actor P: mat Range
classes, and they developed trading and residential interests

who sought above all else to maintain a sedate, orderly way of

life, with nothing to disturb the invalid or shock the

\+ C: Time
susceptibilities of the respectable family. But when the

railways in the 1840s and 1850s and the rising real wages of

the late nineteenth century enabled visitors of lower social

status and with different tastes to appear in large numbers,

Actor
the established visiting public and its resident allies and

P: "mat" Range Senser P: ment Phenomenon
dependants took fright. They feared that horseplay,

noise and drunkenness would damage their amenities and threaten

\+ Senser P: ment Phenomenon
their livelihood; and they viewed the stallholders,

cheapjacks, hawkers and beach entertainers, who followed in the

C: Accomp Actor P:mat
wake of the working-class invasion, with alarm. They sought to

Goal +
curb the influx of excursion trains, especially on Sundays, and

P: mat Goal C: Means
to restrict the public behaviour of trippers by imposing and

C: Purpose
enforcing by-laws to proscribe boisterous behaviour and

Actor [Text] P: mat
uncultivated alfresco entertainment. They also tried to cut

Goal
through what was often a tangle of conflicting jurisdictions

C: Purpose
in order to regulate beach trading and suppress dangerous or

Phenomenon
otherwise undesirable foreshore activities. 'Respectable'

working-class visitors, who reacted passively to their

surroundings and accepted a silent and subordinate place in the

P: ment C: Quality
seaside scheme of things, were tolerated with condescension;

\+ Range
but assertive trippers, who set out to enjoy themselves in

P: "mat" C: Quality C: Place
their own way, were met with angry opposition. In some

Actor
resorts, large landowners in alliance with strong and single-

P: mat Range C:
minded local authorities were able to defend the status quo by

Means
freezing the boisterous excursionists out, or confining them to

limited, well-defined areas at a safe distance from the middle-

class families and well-heeled residents on whom the resort's

+ C: Place
bread and butter was thought to depend; but where a strong
pressure of demand found divided or disorganised opposition,
and gained a foothold of support among local businessmen,
entertainment promoters and property owners who saw profit in

Actor P: "mat"
the working-class presence, large sections of a resort could go

C: "Place" C: Temporal Token P:rel Value
down-market very quickly. This kind of conflict was common

Sayer
to almost all resorts near major population centres. It

P: verb Verbiage C: Accomp
expressed economic divisions between the residents as well as

+ Actor P: mat
opposing views on morality and propriety, and it exposed

Goal
the limitations of the ideal of the seaside as a harmonious

C: Time
social melting pot. By the early twentieth century,

[Modal] Actor P: "mat"
admittedly, a more tolerant middle-class consensus reached out

C: Accompaniment C: "Place"
with growing confidence to an increasingly respectable

Actor
mainstream working-class culture in some resorts. All classes

P: mat C: Place
mingled in Edwardian Blackpool at the Tower Ballroom and Winter

[Text] + C: "Spatial" Carrier
Gardens, for example; but for the most part, the classes

P: rel Attribute C: Quality
continued to be segregated geographically, residentially or (in

C: Place C: Comparison
a few cases) seasonally, at the seaside just as they were

Token
inland. The social harmony of the Edwardian seaside, such as

P: rel Value C: Comparison
it was, owed more to class segregation than to social
reconciliation.

HL1:3 paras 2-5 (Class conflicts)

Carrier P:rel Attribute C: Place
These developments were particularly pronounced in many areas,

C: Time
at a time when there was a growth in working-class free time as

C: Reason
well as spending power, because the seaside appealed to the
whole spectrum of popular attitudes to leisure, from the narrow
dedication to the pursuit of physical, intellectual and moral
health and improvement, to the more diffused desire to "have a
spree" away from the depressing constraints of the working

Actor +
environment. The earliest railway excursions to the coast both

P: mat + P: mat Range Carrier
responded to and stimulated this wide range of demand. Sunday

P:rel
Schools, temperance societies, and paternalistic employers were

Attribute
quick to use the seaside excursion as a counter-attraction to
the fairgrounds and race meetings which still dominated popular
holidays in the industrial towns in the early Victorian years,

C: Reason
for a seaside visit offered obvious opportunities for the

\+ Possessor
pursuit of health and educative recreations. But the enjoyment

[Text] P: rel
of cheap travel and the cult of sea bathing also had

Possessed C: Place Act P: mat Range
devotees among the unregenerate. Many patronized the Sunday

C: Accompaniment
School and temperance outings without subscribing to the values

Actor [Text] P: mat
which motivated their promoters; Ramsgate, for instance, found

Range
that not all of the "reputed advocates of total abstinence from

intoxicating liquors" who arrived on special excursions were as

C: Time
staid and decorous as might have been expected[2]. From an early

[Text] Actor P:mat Range C: Purpose
stage, however, the railways gave facilities for entrepreneurs

\+ P:mat Range
to get up excursions on purely commercial lines, or ran cheap

C: Behalf + Actor
trips on their own account; and these open excursions, which

often ran on Sundays, especially in the south of England,

P: mat Goal
attracted those who sought their pleasures in the beerhouse as

Senser
well as on the beach[3]. The earliest days of cheap travel for

P;"ment" Phenomenon
the masses saw the seaside opened out to all those who

could afford the journey, which often cost much less than a

\+ Actor
day's wages for a skilled workman; and the working-class

C: Time C: Comp
seaside holiday, as it grew out of the day excursion, similarly

P: mat Ben C: Matter
catered for all shades of opinion as to the proper way of using

leisure time.

C: Time
As working-class visitors joined their social superiors at the

Actor P: mat Range +
seaside in ever-increasing numbers, they posed problems and

P: mat Range C: Place Actor
offered opportunities in the resorts. The existing "better-

C:Freq P:mat C: Qual C: "Place"
class" visiting public often reacted angrily to the proximity

\+ C: Place
of the more boisterous of the excursionists, but in some places

Actor P: mat Range
the new visitors came to constitute a market of sufficient size

C: Result
and apparent elasticity to encourage entrepreneurs to cater

[Modal] C: Place
specifically for them. Indeed where working-class demand was

Senser P: "ment" Phenomenon
heaviest some resorts saw their economies transformed in the

C: Time
late nineteenth century, as the "better-class" visitor began to

retreat to quieter and more select holiday and residential

C: "Place" Actor
haunts. Under these circumstances, the commercialization of

C: Time P:mat
entertainment which was developing rapidly inland soon made

Range C: Place + Range
its appearance at the seaside, and stalls and fairground

P: mat C: Time
attractions were supplemented in the later nineteenth century

C: Means
by increasingly heavily-capitalized entertainment centres.

C: Place Senser
Where this happened, the organizers of Sunday School and

P: ment Phenomenon +
temperance excursions began to look for safer destinations; but

C: Time Actor
by this time the commercial excursions and the railways' own

P: mat Goal + Actor
regular cheap holiday fares dominated the market, and the

P: mat C: Quality
popular resorts were able to grow at a rapid rate[4].

Token [Text] P: rel Value
Such developments, however, depended on the regular appearance

of large numbers of working-class visitors who stayed for a few

days and the formation of a demand which was spread over

Possessor
several weeks of the summer[5]. The working-class day-tripper

C:Freq P:rel Possessed C:Accom
never had much to offer the economy of most resorts, apart

from that part which consisted of beerhouses and cheap eating-

C: Concession
houses, stalls and beach amusements, although in the later

Victorian years he provided added encouragement and increased

dividends for the great entertainment centres of the larger

C: Time [Text] Actor
resorts[6]. At an early stage, however, some of the more thrifty

and resourceful of the better-paid working-class visitors

P: mat Range C: Temporal Actor
contrived to extend their stay to a week-end and beyond. This

P:- [Modal] -mat C: Place
may well have been happening in Gravesend, "the goal of

C: Time
every young cockney's Sunday excursion", as early as the

C: Time
'twenties and 'thirties in the heyday of the cheap Thames

C: Time [Modal] Actor
steamer trip. By the late 1850s, at any rate, a working-class

P:- [Modal] -mat C: Place
accommodation industry was clearly emerging in some resorts,

Attribute
the prelude to the appearance of a specialized working-class

Carrier P:rel Attrib
season alongside the existing one. This was true

C: Matter
especially of the resorts in easy reach of the textile
conurbations of Lancashire and the West Riding of Yorkshire,
and the arc of seaside resorts along the Kent and Sussex coasts

Phen P: ment
to the south of London, especially in Thanet. It can be seen

C: Place C: Time + C: Place
in Blackpool and Scarborough at this time, and even in
Ramsgate, where, in 1861 a witness pointed out that besides the
high-class lodging-houses on the cliffs, there was
accommodation in the lower town near the harbour for "a vast
number of other people, a class of an inferior kind"[7].

C: "Place" [Dir] P: ex Existent
From these beginnings, there emerged a distinctively working-

C: Time
class holiday industry during the period of falling prices at

+ Actor
the end of the nineteenth century; and the new pattern of

P: mat Range C: Place
demand began to generate employment in lodging-house keeping,

Actor
building, retailing and other services. The lifestyles of the

[Text] P: mat Range C: Accompaniment
new visitors often generated conflict with the established

+ Actor
branches of the holiday trade, but the working-class season,
augmenting as it did an already swelling rush to the sea by

P: mat
workers in the expanding white-collar occupations[8], provided

Range C: Place
a new impetus to growth in many late Victorian resorts.

Actor P: mat Range C:Place +
Blackpool provides the most obvious example here, but

Phenomenon
Southend, Cleethorpes, Yarmouth, Scarborough, Morecambe and

P: ment Attribute C: Place
several others can be seen to fit this pattern. In the north

[Modal] Actor
of England, at least, the most rapid large-scale resort growth

P:mat C: Place
of the late nineteenth century came where the working-class

+ [Dir] P: rel Carrier
presence was most strongly felt, and it was the resorts

Attribute
which adapted best to this new stimulus which expanded fastest.

[Text] Actor
On the other hand, resorts like Southport, which had prospered

P: mat
in the mid-Victorian heyday of the solid middle classes, found

Range C: "Place" +
difficulty in tapping the new sources of growth, and

P: mental Phenomenon C: Reason
experienced relative stagnation as residents and landowners

resisted popular amusements and an inferior class of housing,

while local government and the local economy remained under the

C: Place
sway of commuters and staid villa-dwellers[9]. Further south

Goal P: mat Actor
the picture is complicated by the meteoric rise of Bournemouth,

C: Accompaniment
Hove and Eastbourne, along with several other select resorts of

C: Comp Actor P:mat
less spectacular growth, while Margate and Ramsgate found

Range
that the early appearance of working-class visitors was no

guarantee of renewed expansion on any substantial scale[10].

Range
Even Southend's remarkable surge of development at the turn of

P: mat C: "Spatial" Actor
the century was fuelled in large part by London commuters,

C: Comparison
while Yarmouth owed its increasing prosperity largely to

\+ C: Place
visitors from the industrial Midlands. But even in salubrious

Actor P: mat
Sussex "better-class" resort growth was beginning to change

Goal C: Time C: Time
its focus by this time, as parts of the central areas of the

larger resorts were being invaded by the working-class visitor,

and as his social superiors retreated along the coastline into

new "marine suburbs", carefully regulated to keep the trippers

at bay, or began the colonization of the remoter coasts of

Devon, Cornwall and Pembrokeshire[11].

HL1:3 para 29 (Class conflicts)

C: Place
Outside the textile districts of Lancashire and the West

[Text] Actor
Riding, then, the survival of irregular working habits, often

associated with a deep attachment to a large number of

P: mat Range
customary festivals, inhibited the thrift and planning which

were necessary for the development of holidays away from home.

[Modal] Actor P: mat Range
In any case, most industrial workers retained a preference for

the safe local pleasures of neighbourly conviviality and

Carrier P:rel Attribute
hospitality. Day-trips were increasingly well-patronized

C: Time + C: Place
in the late nineteenth century, but over most of industrialized

Possessor
England only the skilled and supervisory groups among the

P:rel Possessed
working class had the will or the resources to take a full-

Carrier P;rel C:Freq
scale holiday away from home. Such working people were usually

Attribute + P:- C: Quality
"respectable" in dress and demeanour, and were more easily

-mat C: Place C: Comparison
assimilated into the resorts than the excursionists, who often

included lively and even uproarious elements whose behaviour

Actor P: mat
was capable of scandalizing their "betters". Conflicts flared

C: Place C: Matter C: Time + [Dir] P:rel
in many resorts on this issue during the 1890s, but it was

C: Time
not until the twentieth century, and especially the inter-war

Token
years, that most working-class day-trippers became

metamorphosed into staying visitors.

HP1:4 para 12 (Changing holiday patterns)

The working-class invasion

Actor P: mat Range
Different resorts responded to the changes in potential and

C: Means [Modal]
actual visiting publics in different ways. As will be clear,

[Dir] P:ex Existent Token
there was no single uniform experience. The evolution of a

P:rel Value
resort's 'social tone' was the product of a mixture of

Token
external and internal influences. The level of working-class

P: rel Value C: Time
demand became increasingly important in the later nineteenth

+ Goal P: mat Actor
century, and this was affected by holiday patterns and habits

C: Place C: Place
in resort hinterlands. Where family incomes were relatively

high and sufficiently regular to encourage saving for future

enjoyment as well as to guard against contingencies, and where

traditional holidays had survived in moderation without

disrupting the whole of the summer as they did in the Potteries

Actor P: mat C: Time
or the Black Country, the seaside habit could develop early

C: Place Carr P:rel Attrib C: Matter
among the working class. This was true especially of the

Lancashire cotton towns, where a pre-industrial tradition of

sea-bathing at the August spring tides gave added impetus to

C: Place
the popular seaside holiday. Where old holidays had been

abandoned or suppressed, or where 'St Monday' was regularly

Carrier
observed through the year, the working-class seaside holiday

P:rel Attrib C: Reason
was much slower to become established, as beery and

Token
neighbourly local pleasures were harder to displace. Cheap and

P;rel Value C: "Place"
rapid transport was obviously important in expanding the

holiday market at all levels, and especially among the working-

+ Carrier P:rel Attrib
class; but the causal impact of railways, as such, was quite

Actor P:mat Range Attrib +
limited. They made increased demand levels possible, and

Senser C: Freq P: ment Phen
the policies of individual companies sometimes favoured some

C: Behalf + Actor
resorts at the expense of others; but the positive impetus to

C:Freq P:mat C:Plce
resort growth and changing demand patterns usually came from

C: Time Actor P: mat C: Time
elsewhere. In the long run, the railways responded, often

C: "Behalf" + C:Time
belatedly, to the rising demand for seaside holidays; but only

in the earliest pioneering days of cheap excursions in the

P:- Actr -mat Range Token P:rel Value
1840s did they help to create it. They were necessary to

C: "Place" + Token P:rel C: Freq
resort growth beyond a certain point but they were seldom,

Value
in themselves, a sufficient cause for expanded levels of

demand.

HL1:4 para 15 (Changing holiday patterns)

Actor P: mat Range
Steady pressure from the labour force brought extensions of the

C: Time
traditional holidays, especially in July and August,

C: Time C:Place
throughout the second half of the nineteenth century. In some

[Modal] Range P: mat C: Time Attrib
places, indeed, new holidays were created in the 1840s, often

arising out of seaside excursions organized by the employers or

Goal
with their approval. Bolton's holiday observances were

P: mat C: "Place" C: Time
concentrated into Whitsuntide throughout the latter half of the

+ Actor P:mat C:Place
nineteenth century, but a subsidiary August break grew out of

the seaside trips organized by the operative cotton spinners'

C: Concession
association[26]. Whatever the origins of the cotton town

Actor P: mat C: Qual C: Time C: Time
holidays, they lengthened inexorably from the 1840s. By the

Possessor P:rel Possessed C: Time
mid-century, Burnley had two free days beyond the week-end

C: Time Actor P: mat Range
at the July fair. Most people in the town had achieved an

C: Time C: Time Goal P: mat C:
extra day by 1870; in 1899 the fair holiday was extended to a

Temporal C: Behalf + Range
full week for the textile workers; and an additional long week-

P:- C: Time -mat C: Time Actor
end in September had already been secured in 1890. The other

P: mat Range Actor
textile towns showed a similar pattern. Oldham and Darwen each

P: mat Range C: Time C: Concess
acquired a full week in the summer as early as 1889, although

in the former case, at least, the actual agreement merely

Actor
legitimized a long-established practice. Chorley and Nelson

[Text] P: mat Range C: Time Actor P: mat
also obtained a full week before Burnley; Blackburn followed

C: Time + C: Time Possessor
in 1901, and by 1905 only Bolton, which still took several days

C:Time P:rel
off at Whitsuntide, and a few of the smaller towns still had

Possessed C: Time Possessor
less than a week's holiday in July or August[27]. Lancashire

P:rel Possessed
cotton workers had longer consecutive recognized summer

C: Time C: Comparison
holidays at an earlier date than anywhere else in industrial

+ Actor
England; and their observance of a regular working week for the

P:mat [Dir] Attrib Range
rest of the time made it easier for them to save and

C: Comparison
prepare for a seaside holiday, rather than losing working time

and spending surplus cash on more immediate gratifications

close to home[28].

HP1:5 para 13 (Effects on resorts)

Token P:rel Value
Developments in the resorts themselves were more to the point.

[Dir] P:rel Value
It was their attractions and adaptability, in conjunction

Token
with social emulation and the vagaries of fashion, that

generated and sustained the growing demand for seaside holidays

Token P: rel
and seaside residence. The policies of landowners were

Value C: Time
particularly important in the early stages of resort growth,

C; Place
especially at places like Eastbourne and Llandudno where

wealthy landowning families were able to plan for high-class

development and protect their vision of decorum and salubrity

through restrictive covenants and the discouragement of pubs

Actor P:- [Text]
and unseemly entertainments. Large landowners might also

-mat Goal
subsidise the promenades, utilities and drainage systems which

were essential but, in themselves, usually unprofitable parts

\+ Actr P: mat C: Purpose
of a resort's stock in trade; and they might step in to support

C: Time
pier and entertainment companies when the latter faltered or

Token P:rel
were slow to materialise. Large-scale entertainment was

C:Freq Value C: Time C: Place C: Concess
rarely profitable in the long run at the seaside, except at

\+ C: "Place"
Blackpool; and in the considerable majority of cases where no

large landowner was able or willing to ride to the rescue,

Actor P: mat Range C: Place [Comm]
local government took on a range of roles at the seaside which

[Modal] C: Place
was rarely matched inland. Indeed, even where landowners had

Actor P: mat
made the early running, local authorities were taking over

C: Place C: Time C: Concession
almost everywhere in Edwardian times, despite opposition from

ratepayers whose incomes were not derived from the holiday

Senser
industry. The leading citizens of successful seaside resorts

P: ment Phenomenon C: Role
might like to think of their towns as brilliant exemplars of

\+ Token P: rel
the success of private enterprise; but most such towns owed

Value C: Quality C: Reason
their attractiveness, in large part, to municipal socialism of

a pervasive and pioneering kind, extending from the orthodox

provision of gas, water, tramways and public order to the more

exotic involvement of local authorities in promenades, piers,

parks, entertainments, marine lakes, golf courses, municipal

Token
orchestras, catering and even advertising. The rising demand

P:rel Value C: Reason
for seaside holidays owed much to the attractiveness of the

\+ C: Means Tok P:rel Val
resorts themselves; and in almost every way this owed more

C: Reason C: Comparison
to municipal enterprise than to the activities of private

entrepreneurs or public companies.

HL1:5 para 16 (Effects on resorts)

Possessor
The evolution of this distinctive Lancashire holiday system

P: rel Possessed C: Behalf Range
had important implications for the resorts. The demand for

P: mat C: Temporal C:
seaside visits was spread over several weeks of the summer, as

Reason +
different towns took their holidays at different times; and

Actor P: mat [Dir] Attrib Range
this accidental stagger effect made it possible for a

specialized working-class holiday industry to emerge at an

C: Accompaniment Token
early stage. Whitsuntide apart, the working-class season

P: rel C: Temporal
lasted only from Burnley Fair in early July to Oldham Wakes in

\+ Token P:rel Value
early September; but even this was enough to attract

substantial investment in accommodation and amusements from the

C: Place
late 'sixties to early 'seventies. In many other areas,

Goal P: mat C: "Place"
working-class demand was channelled into August Bank Holiday

week as it developed from the late 'seventies onwards.

Carrier P:rel Attribute + [Dir]
Railways and resorts were uncomfortably crowded, and there

P:ex Existent
was nothing to encourage the provision of permanent amenities

C: Place [Text]
for the working-class visitor. In textile Lancashire, however,

Carrier P:rel Attrib C: Conc
August Bank Holiday was unimportant in its own right, except

\+ Actor
for a few office workers and shop assistants; and the longer

P: mat Range C: Result
season enabled some of the resorts to make themselves

[Comment]
attractive to the working-class visitor, which in turn gave a

further stimulus to the already buoyant demand for seaside

Token
visits among the operatives and their families. Rhyl, Douglas,

P:rel C: Place
New Brighton, and Scarborough were among the resorts which

\+ Phenomenon P:ment
responded to these developments; but the relationship can be

C: Quality C: "Place"
seen at its most effective in the remarkable growth of

Blackpool[29].

HP1:6 para 14 (Conclusion)

The scope for further work

Token P:rel Value + Ben
Seaside resorts were peculiar but important places, and they

P:mat Range C: "Place"
need to be given due weight in any assessment of urban

Sayer P:verb
development in Victorian and Edwardian England. I have

Verbiage
tried to explain the nature and significance of the rise of the

solid, substantial crescents and terraces of the resorts of the

\+ Range C: Role
steam age; and the basic pattern of resort development, as it

P:- C: Qual -mat C: Time Actr
remains with us, was firmly established by 1914. Not that the

P: mat C: Place Actor P:mat Range
story should stop at that point. We need further work

C: Matter
on the changing fortunes of seaside resorts in the inter-war

\+ Senser [Text] P: ment Phen C: Matt
and post-war years; and we also need to know more about

the resorts of Scotland and Ireland, which have so far been

Actor
neglected by serious historians. The rise of the bungalow, the

chalet, the caravan and the holiday camp in the age of the

motor car and the charabanc, and the changing experience of

seaside England in the age of the package tour and the

P: mat
aeroplane, the holiday flat and the nude bathing beach, will

Range C: Behalf C: Time
provide stimulating material for many historians in the future.

C: Time Ben P: mat Range
In the meantime, the seaside resort should be granted the

C: Place
prominent place it deserves in general analyses of urbanisation

and social change during the key decades of transition to

industrial society in Victorian and Edwardian England.

HL1:6 para 32 (Conclusion)

Actor [Text] P:mat Goal
The loss of traditional summer holidays, then, retarded the

C: Quality
development of the popular holiday industry just as seriously

C: Comparison
as did too strong an attachment to irregular work and frequent

C: Result Actor
popular festivals. As a result, much of the southern half of

P:- C: Spat -mat C: Place C:Time
England was only just passing beyond the excursion stage by the

C: Concession
turn of the century, although Southend, Yarmouth, Weston-super-
Mare, and the Thanet resorts were already seeing a deeper
+ Actor
working-class penetration of their local economies. But the
P: mat C: Place
really early advances had come on the coasts of Lancashire and
Attribute Actor
North Wales, fed by the Lancashire textile workers. Their
P: mat Goal C: Place
patronage had stimulated early investment in amusements and
+ Actor [Text] P:
accommodation for a working-class market, and this in turn had
mat Range Attrib C: Behalf
made the resorts more attractive not only to Lancashire working
men and their families, but also to excursionists from the West
C: Place
Riding of Yorkshire and, later, the West Midlands. In all
Range P: mat C: Means
these areas, the holiday habit was encouraged by the cheap
amusements and ample but unpretentious accommodation on offer
in those resorts which were able to adapt to the needs of
C: "Spatial"
working-class visitors in large numbers. To a lesser extent,
Token P:rel Value
Cleethorpes, Bridlington and Scarborough were early
beneficiaries of a growing demand from Sheffield and the West
Riding woollen district in the last quarter of the nineteenth
C: Place Token
century. In these areas of northern England, the working-class
P: rel Value
holiday became a mass experience, shared by almost every family
which was not incapacitated by unemployment or the poverty
cycle, at least twenty years before it gathered strength in

Token
other parts of the country. The reasons for this precocious
P:-
development, and the pattern of change elsewhere, can be

C: Qual -rel Value
directly related to the speed and circumstances of town growth
and industrial development in the hinterlands of the resorts,
and above all to the relationship between family incomes,
labour discipline, and the persistence of local holiday

[Dir] P:ex Existent
customs. There can be no doubt that it would be profitable to
adopt a similar approach to the analysis of other aspects of
working-class leisure in the nineteenth century[64].

Field: History, No.2
Popular article: "The Bishop's Wars" (HP2)
Learned article: "Scottish covenanters and Irish confederates" (HL2)

Analogous passages

HP2:1 para 1 (Introduction)

C: Time Actor P: mat Goal C: Result
By 1637 Charles I had provoked his Scottish subjects into

C: Means
revolt against him through absentee, arbitrary, absolutist and,

C: Time
perhaps worst of all, anglicising government. In the spring of

Actor P: mat Range
1638 the king accepted that he could restore his authority in

[Text] Senser P: ment
Scotland only by military means. Further, he recognised

Phenomenon
that support for him in Scotland was so weak that a military
solution would need to come from outside -- from England.

C: Concession
Given the fact that England had five times the population of
Scotland, and that the difference in wealth of the two

Carrier P: rel Attrib
countries was far greater, Charles must have been confident
that he could subdue those distant provincial nuisances, the

[Text][Text]
Scottish Covenanters, without too much difficulty. Yet in the

Act P: mat C: Qual + Act C:"spat"P: mat Goal
event he failed disastrously, and this so undermined his

C: Result
prestige that it led to the collapse of his power in England

[Txt] P:"mat" C: Qual +
and Ireland, as well as in Scotland. What went wrong -- or

C: Qual C: "Place"
right, from the Scottish point of view?

HL2:1 para 1 (Introduction)

The Ulster Scots

Actor
The shortness of the sea crossing between Ulster on the one
hand and Argyll and the western Lowlands of Scotland on the
P:- C: Freq -mat Range C: "Place"
other has always ensured close contacts between the
C: Time
inhabitants of Ireland and Scotland. At the beginning of the
Actor
sixth century the Scots, who had come from Ireland and settled
P: mat Range C: Place Attrib C: Time
in Argyll, created a new kingdom there, Dalriada; later
Act P: mat Ben Range
they were to give Scotland both her ruling dynasty and her
Actor C:"spat"P:mat C: Place
name. Christianity partly came to Scotland from Ireland,
C: Means
through the work of Columba (who landed on Iona in 563) and
others.

HL2:1 (cont) para 23 (Introduction to Bishops' Wars)

The First Bishops' War, 1639

[Modal] C: Time
Not surprisingly, once resistance to the king in Scotland
Actor P:mat C: Qual C: Place C:Time
began, suspicion of the Scots grew fast in Ireland. In
Actor P: mat Goal
September 1637 Wentworth obstructed the attempts of the earl of
\+ C: Time Act C: Qual
Ancrum to obtain land in Ireland[40], and in 1638 he strongly
P: mat Goal
opposed an offer by the marquis of Hamilton and other Scots to
Sayer
take over London's lands in County Londonderry. Wentworth

P: verb Verbiage C: Role
denounced the scheme as likely to put all Ulster under Scots control, at a time when many of the Scots already there were showing their dislike of English laws, both civil and

C: "Place" Possessor P: rel Possessed
ecclesiastical[41]. In this he had the full support of William Laud, archbishop of Canterbury, who wrote to him denouncing the Scots and emphasising that it was 'no time to weed the English out of Londonderry to make room for more of

[Modal] Token P: rel
that leaven'[42]. Ironically, both Ancrum and Hamilton were to

Value C: "Place"
prove supporters of the king in his struggle with the covenan-

Goal [Modal] P: mat C: Place C: Role
ters; Hamilton indeed was sent to Scotland as king's

C: Time C:
commisioner, Charles' personal representative, in mid-1638 to

Purpose [Text] Verb-
negotiate with the covenanters. By contrast Sir John Clotworthy, an English planter in Antrim, whose offer to take over the Londonderry lands Wentworth had preferred to

P:- C:Time -verbal -iage
Hamilton's[43], was soon reported to be in Edinburgh 'to salute the kirk', meeting (and evidently offering to supply

Token P:rel
intelligence to) leading covenanters[44]. English blood was no

Value
guarantee of loyalty.

HP2:2 paras 2-4 (Preparations for war)

[Text] Carrier P:rel Attribute + Carr P:rel Attrib
First, Charles was overconfident, and he was inexperienced

[Text] Act P: mat Range
in military matters. Second, he failed to take account of how

his English subjects would react to being told to fight the

Attribute
Scots, perhaps assuming that they would be eager to attack

\+ C: Concession
their traditional enemy in the north. But though Englishmen

Senser P: ment
had little liking or respect for the Scots, many sympathised

\+ P: mat C:"spatial" Phenomenon/Range
with, and shared to some extent, the grievances that had led

Senser P: ment Phenomenon
the Scots to revolt. They disliked arbitrary government and

[Text] Actor
the king's religious and other policies as well. The Scots

P: mat Range C: Behalf Actor
were making a stand against the king: to help him defeat them

P: mat Range Attribute C: Comp [Text] Actor
would make him more inflexible than ever. Thus the king

P: mat Range C: Time
found a widespread lack of enthusiasm in England when he tried

Attribute
to mobilise the country against the Scots, responses varying

from sullen obstruction to open violence when attempts were

made to enlist men.

[Text] Senser P: ment Phenom Attribute
Third, the king had underestimated the Scots. Convinced that

Ben P: mat Actor
God was on their side, they were inspired by the national

myth of their country as the never-conquered nation that had

always managed to defeat the efforts of its great neighbour to

Actor
destroy it. Charles's decision to use an English army to

C: Means P: mat Ben
restore order in many respects helped the Scots' war effort:

Sayer P:verb Target Verbiage
it persuaded many doubters that resistance to the king was

justified, that the cause of the Covenant was the patriotic

cause, the only alternative being English occupation.

C: Time Actor P: mat Goal
In 1639 Charles finalised plans for the great assault on

Actor P: mat Range C: Place
Scotland. His main army would cross the Tweed at Berwick,

Attribute Actor P: mat Range
making for Edinburgh. A large naval force would enter the

\+ P:mat Range Actor
Firth of Forth and land thousands of men. The royalists of

P: mat C: Qual + Range P: mat
the north-east would rise in arms, and men and weapons would be

C: Means C: Place C: Purpose C: Place
sent by sea to Aberdeen to strengthen their forces. In the

Actor P: mat C: Place
west an army from Ireland would cross to the western Lowlands -

\+ [Text] P: verb Verbiage Actor
\- or at least would threaten to do so. Other forces from

P: mat C: Place P: Purpose
Ireland would land in the western Highlands to encourage

royalist clans and attack the Cambells, whose chief the earl

(later marquis) of Argyll had emerged as the most influential

Attribute Goal
of the Covenanter leaders. Attacked from all sides, the

P: mat Result +
Covenanters would be forced to divide their forces and

[Text] P:- C: Temporal -mat
therefore would eventually be overwhelmed.

HL2:2 para 20 (Preparations for war)

C: Time Verbiage P: verbal
At the end of February 1638 the national covenant was drafted

+ P: verb C: Role
and signed as a bond of union among the king's opponents in

C: Time Token P: rel
Scotland. By this time effective control of the country was

C: Place + Senser C:Time P:ment
in the hands of the covenanters, and Charles I soon concluded

Phenomenon
that Scotland could only be reduced to obedience by force, by

invasions from his other kingdoms to support the Scottish

Actor P: mat Range
royalists. Both king and covenanters began to prepare for war.

Possessor [Modal] P:rel Possessed C: "Place"
These events naturally had profound effects on Scottish Irish

Phenomenon
relations. The Scots colonists in Ulster, originally seen as

C: Time P: ment
bulwarks of English authority in Ireland, now became

C: Role
regarded as the main threat to it.

HP2:3 para 5 (Problematic policies)

Phenom P:ment Attrib C: Place + Carr P:rel Attrib
The plan looked good on paper, but it was far too

Actor
elaborate. Attempts to raise the forces necessary for the war

P: mat C: Time Range
demonstrated simultaneously the total lack of support in

England for the war and the basic inefficiency and incompetence

of the administrative machinery through which the war effort

C: Time Actor P:mat C: Pl
was being organised. In the summer of 1639 Charles came to the

C: Purpose + Actor
Borders to lead his army into Scotland, and the marquis of

P: mat Range C: Pl C: Purpose
Hamilton sailed a fleet north to threaten the Lothians and

Fife.

HL2:3 para 26 (Problematic policies)

Token P:rel Value
The trouble with this policy was that it assumed that the
covenanters would either submit, or be attacked by the king
[Text] Actor P: mat Range
immediately. In the event the covenanters refused to submit
+ Token P:rel Value [Text]
but the king was not ready to invade Scotland. Consequently
[Dir] P: rel Carrier Attribute
it was the king, not the covenanters, who was forced to
make concessions, to try to restrain the covenanters until his
Phen P: ment Senser
military preparations were complete. This delighted the Ulster
Target P; verb
Scots; Bishop Henry Leslie of Down (himself a Scot) was told
Verbiage
that a petition to the king was being circulated asking for
similar concessions to be made in Ireland -- 'there is such
insulting amongst them here, that they make me weary of my
[Modal] Carrier P:rel Attrib C: Condition
life'53. Clearly some action was necessary if control of
Ulster was not to be lost through inaction on the part of the
C: Time Sayer
government, as Scotland had been lost. On 4 October Wentworth
P: verb Verbiage
wrote that disobedience ought 'quickly and roundly to be
corrected in the first Beginnings, lest dandled over long, the
Humour grows more churlish and difficult to be directed and
Goal
disposed to the peace of Church and Commonwealth'; the names of

P: mat + Range P: mat C: Behalf
non-conformists were to be taken and action taken against
them[54].

HP2:4 paras 8-10 (Treaty of Berwick/Invasion of England)

Attribute Actor
Realising the potential danger in the north-east, the

P:mat Goal C:Place Attribute
Covenanters sent forces north led by the earl (later
Marquis) of Montrose -- a fervent Covenanter at this time,

[Dir] P:ex
though later to become the great royalist champion. There was

Existent C: Place Range P: Mat
some confused fighting in the north-east: Aberdeen changed

C: Freq + C: Place C: Time Senser
hands several times, and further north on 14 May the 'Trot of

P:ment Phenomenon
Turriff' saw royalists drive Covenanting forces from that

+ Actor [Text] P:mat Range
town. But the Covenanters finally gained control of the region

C: Time
after the Battle of the Brig o' Dee on 19 June, when Montrose's
men stormed across the bridge and occupied Aberdeen -- the day
after the king had swallowed his pride and made a compromise
peace with the Covenanters at Berwick upon Tweed.

Senser P:ment Phenomenon
Many hoped the Treaty of Berwick would provide a lasting

+ Senser P:ment Phenom Senser P: ment Phenom
peace: but few expected it to. The king had realised that
he had not gathered sufficient men to invade Scotland with

+ P:ment Phenom C: Role
confidence, but saw the treaty as merely a temporary
humiliation, necessary to provide him with a breathing space

+ C:Time
while he prepared for a new military effort in 1640. But in

C: Comp Senser P:ment C:Qual Phenomenon
1640 as in 1639 the Covenanters knew well what the king

+ C:Freq Token P:rel C: "Place"
intended, and again time proved to be on their side, not on

C: Purpose
his. So they could concentrate their attention on the Borders,

Range P: mat C: Place C: Purpose
a force was stationed in Aberdeen to ensure that there was no

C: Time
further trouble in the north-east, while Argyll led his men on

a long march through the Highlands to overawe potentially

royalist clans.

C: Comp Possessor P:rel Possessed
As in 1639, the king had grandiose dreams of threatening

Scotland on all sides while his main army crossed the border.

C: Freq Actor P:mat Range
Again harsh reality failed to live up to his expectations.

Actor P:
Open opposition to the war, and to his policies in general, was

mat C: Qual C: Place C: Time
spreading fast in England. While he struggled with these

Senser P: ment Phenomenon Actor
problems the Covenanters decided to take the initiative. They

P: mat Range C: Place
could not keep the large army they had raised in the field

C: Temporal Attribute
indefinitely, waiting for a time when it suited the king to

[Text] Actor P: mat Range C:
invade Scotland. Therefore, they would force a showdown -- by

Means
moving first and invading England.

HL2:4 para 53 (Treaty of Berwick)

The Second Bishops' War, 1640

Actor P: mat Goal C: Result
The king's failure to invade Scotland forced him to make a

peace with the covenanters, the treaty of Berwick, signed on 18

Senser P: ment Phenomenon Actr
June 1639. Neither side expected lasting peace to follow; each

P: mat Range
agreed to the treaty to postpone a conflict until circumstances

\+ Actor P: mat Range
were more favourable to it, and Ireland continued to play a

major part in Charles' plans for the eventual subjection of

Ben [C: Time] P:-
Scotland. Donald Gorm (at this time or soon afterwards) was

[Modal] -mat Range +
apparently supplied with a ship and arms for 1,000 men[112]; and

C: Time
on 5 June (just before the start of negotiations with the

Actor
covenanters) and 11 June (after negotiations had begun) Charles

P: mat Goal C: Role
appointed Donald Gorm and Antrim to be his joint lieutenants

C: Purpose
and commissioners in the Highlands and Isles, to act against

[Text] Ben P: mat Range + Poss-
his enemies. In return Antrim was promised Kintyre, and Donald

-essor P: rel Possessed
Gorm of Sleat was to have Ardnamurchan, Strathswordale in Skye,

'Punard' (evidently Sunart) and the islands of Rhum, Muck and

[Dir] P:- [Modal] -ment Phenomenon
Canna[113]. It was no doubt intended that Antrim should

make use of his men in Ireland in attacking the king's enemies

\+ Actor P: "mat" Range
in Scotland but the commission made no mention of Ireland;

[Modal] Senser P: ment Phenomenon
probably Charles recognised that it was hopeless to try to get

\+ [Text] P: verb
Wentworth and Antrim to work together, and therefore offered

Rec Verbiage
them no help from Dublin.

HL2:4 (cont) paras 58-59 (The Treaty of Berwick, cont./
Invasion of England)

[Text] C: Place Range P: mat
Thus in all three kingdoms the treaty of Berwick was used

C: Purpose
to provide a breathing space in which to prepare for a new war.

Senser C: Concession
The covenanters, while still fearing a Highland rising stirred

C:Time P: ment Phenomenon
up by Antrim and his friends, soon decided that the main

threat to them from Ireland was that posed by Strafford's new

C: Time [Dir] P: verb C: Place
army. As early as 17 March 1640 it was being said in

Verbiage
Edinburgh that if Strafford brought his army to Scotland,

Argyll would in retaliation lead an army to Ireland (for which

boats were already prepared), where supporters of the covenant

C: Time Ben P: mat
would rise to join him[119]. Later Argyll was assigned

Range
responsibility for defending the west coast north of the Clyde

C: Time
from an Irish landing, while the earl of Eglinton defended the

[Dir] P:rel Value Token
south[120]. It was a change in the king's plans that made

C: Comparison
these defensive measures necessary; instead of the whole of the

[Dir] P: ment
new Irish army entering Scotland by way of England it had

Phenomenon
been decided that at least part of it should sail directly to

Goal P: mat Ben
Scotland. Dumbarton Castle had been handed back to the king

C: Time + Range
after the treaty of Berwick and Strafford's idea of landing

P: mat C: Concession
troops there had been revived, though he was worried by the

\+ C: Comp
presence of Argyll's frigate on the Clyde[121]. But, as with

Goal P: mat
almost all royalist plans in 1639-40, Strafford's was ruined

Actor Senser P:- [Text] -ment Phenomenon
by delays. He had at first hoped to have his new army of

\+ [Text] Range P:-
9,000 men at Carrickfergus in May, but in the event it was

C: Qual -mat C: Time + C: Time Act [Modal]
not fully assembled until mid-July, and even then it probably

C:Time P:mat Range
still required training[122].

Senser P: ment Phenomenon
The covenanters appear to have realised that the new Irish army

was no more ready to invade Scotland than the king's army on

C: Reason
the Border was, for they felt it safe to let Argyll and 4,000

of his Highlanders leave the coast opposite Ireland and, in

June and July, carry out a long march through the Highlands to

[Dir] P:rel Value Token
overawe any potential royalists[123]. It is likely that the

covenanters had already resolved to force the king to fight by

invading England, and were anxious to ensure that there was no

Value
Highland royalist rising behind their backs. The other main

P:rel Token
danger they foresaw if they invaded England was that

Strafford would lead a diversionary raid from Ireland, or would

[Text] C: Time
send his army to help the king in England. Therefore, before

Actor
their army entered England on 20 August 1640 the covenanters

P: mat Goal C: Result + C: Condition
commissioned Argyll to remain in Scotland and, if necessary,

C: Result
raise an army of 10,000 foot and as many horse as possible.

C: Condition Target P: verbal
If Strafford moved his army to England Argyll was instructed

Verbiage C: Condition Actor P:mat
to invade Ireland; if Strafford landed in Scotland Argyll would

Range C: Behalf Pheno- P:-
lead forces against him. This commission to Argyll was

[Modal] C: Qual -ment -menon
undoubtedly partly intended to make the king think twice before

Sayer P: verb
using the Irish army against the covenanters; they wrote

Attrib + [Modal] Sayer P: verb
telling Hamilton of the commission, and obviously he would

Target Verbiage + Carrier
inform the king of it[124]. But those who thought the commission

P: rel
'may be but a boast to hold the Irish army at home'[125] were

Attrib [Text] Actor P: mat Goal C:
wrong. In the event the covenanters did not send an army to

Place + Token P:rel Value
Ireland, but their plans to do so if necessary were no idle

Sayer
boasting, a bluff which could safely have been called. The

fact that at this very moment they were successfully invading

P: verbal Verbiage
England indicated that they lacked neither the daring nor the

skill required for such an enterprise.

HP2:5 paras 15-17 (Conclusions)

Carrier P:rel Attrib Sayer
The consequences of the Bishops' Wars were profound. The

P: "verbal" Verbiage
Scots had called the bluff of the seemingly all-powerful king,

C: Result C: Time
demonstrating his true weakness. After long negotiations in

Actor P: mat C: Place + P: mat
London in 1640-1 Charles came to Edinburgh, and acceded to

Range
the destruction of his power over the Church of Scotland and

C: Behalf
the abolition of bishops in favour of a presbyterian system of

C: PLace Act C: Qual P: mat
church government. In the state he virtually surrendered

Range Beneficiary C: Result
power to the Scottish parliament, leaving himself in the

Carrier
position of a mere figurehead. The triumph of the Covenanters

P: rel Attrib Value
seemed complete, a remarkable revolution achieved against what

had seemed to be overwhelming odds.

C: Time [Text] Token P: rel Value Actor
Within a few years, however, victory turned to disaster. The

P: mat Goal [Text] C: Time Act
Bishops' Wars had destabilised all Britain. First in 1641 the

oppressed Irish Catholics, inspired by the Covenanters'

P:mat Range Attribute
example, rose in rebellion. Seeing this as a threat to the

Scottish settlers in Ulster, and indeed to Protestantism

Actor P:mat Goal C: Place
throughout Britain, the Scots sent a large army to Ireland

C: Time [Text] C: Time Actor P: mat C: "Place"
in 1642. Then in the same year England collapsed into civil

+ C: Time
war between the king and the English parliament, and in 1643

Senser P:ment Phenomenon
the Scots felt that protecting their revolution necessitated

[Dir]
sending another army to England to help parliament there. It

P:rel Attrib Carrier
was clear that the king had only made concessions to the

Scots in 1641 so that he could concentrate on overcoming his

English enemies, and that once he had subdued them he would

turn his attention back to punishing the rebellious Scots.

C: Reason
In seeking desperately to find security for Scotland within

Actor P: "mat" Goal + [Text]
Britain, the Covenanters overstretched themselves; and in the

Phen C:"spat"P: ment Senser C: Means
end they so infuriated the English through their

C: Result
interference south of the border that Scotland was invaded and

[Text] C: Time Token
conquered in 1650-1. Thus within a decade the great Scots

P: rel Value
triumph of the Bishops Wars' was converted to the ultimate

Goal P: mat + Phen
disaster. The never-conquered country was conquered, and the

consequences of the Covenanters' early triumphs in the Bishops'

P: ment C: Role
Wars can be seen as leading directly to this disaster.

HL2:5 paras 63-68 (Conclusions)

[Modal] C: Quality Carrier P: rel Attribute
Of course in one respect Strafford had proved more efficient

C: Comp Actor P:- [Text] -mat C: Qual Range
than Antrim; he had at least managed to raise in arms the

[Text] C: Concession
number of men he had promised. So while it had been
Strafford who had denounced as dangerous Antrim's plans to arm
[Dir] P:rel Value
and train thousands of Catholics, it was Strafford himself
Token C: Accompaniment
who eventually did this, with disastrous consequences for
C: Time
English and protestant interests in Ireland. As soon as a
C:
cessation was signed between the king and the covananters (at
Place C: Time Goal P: mat
Ripon on 17 October) Strafford's new Irish army was transformed
C: "Place" Sayer
from an asset into a liability. The fact that it was largely
P: "verb" Verbiage
Catholic meant that it roused deep suspicion in England,
\+ Actor P: mat
Scotland and Ireland; and the need for money to pay it forced
Goal C: Result
the government to listen to the Irish government's demands for
C: Place C: Comp Beneficiary
constitutional reform. In Ireland as in England discontent
P: mat Range
with the rule of Charles I was given 'an opportunity for
Actor
political activity' by his failure to suppress the covenanters,
which forced him to summon parliaments in both countries+30.
Phenomenon
The weakness of the crown, now powerless in Scotland and under
[Modal] P:"ment" Senser
attack in the English parliament, naturally encouraged the
Actor
ambitions of various groups in Ireland. The 'Old English'
(descendants of pre-Elizabethan settlers who had remained

P: mat C: Time C:"Place"
Catholics) and protestant settlers combined in 1640-1 in an

C: Place
attack on Strafford and his policies[131]. Outside parliament

Sayer
Ulster protestant settlers of puritan or presbyterian outlook,

P: verb Verbiage
mainly Scots, issued a remonstrance denouncing the Irish

bishops for their sins -- including their hostility to

C: Time
covenanters[132]. In March and April 1641, during the trial of

[Dir] P:ex Existent
Strafford by the English parliament, there were mob attacks by

C: Behalf
protestant settlers (again mainly Scots) on conformist

C: Place C: Time
ministers in at least nine parishes in Antrim and Down, while

'the Scottismens frequent brags in the North, that General

Leslie wold come over ere long, and make a general reformation'

caused fear and unrest among the Irish[133].

C: Accompaniment
With both the civil and the ecclesiastical authorities under

Senser P: mental Phenomenon
attack, the native Irish began to reconsider their position and

[Text] Actor P: mat C: Res
prospects. On the one hand royal power was collapsing, which

might provide them with opportunities to improve their

[Text] Sayer
position; on the other the bitter hatred of Catholics expressed

P: verbal
by the covenanters and the English parliament seemed to

Verbiage
indicate that they might well end up worse off than before.

Goal P: mat C: Time + C: Time Goal
Strafford was executed in May 1641[134], and the same month his

P: mat C: Result
new Irish army was disbanded, adding to the political

instability in Ireland the presence of several thousand trained

but leaderless Irish Catholic troops.

[Dir] P:rel Value
It was not just the collapse of royal power, and fear of how

those who seized power from Charles would treat Catholics,

Token Actor
which sparked off the Irish rebellion of 1641; the king's own

[Text] P: mat Range
incompetent plotting also made a major contribution.

Attribute
Finding himself unable to gather sufficient support in England

Actor P: mat Range
to resist the English parliament, the king sought new allies

C: Place C: Time C: Place Act P:mat Ben
in Scotland and Ireland in 1641. In Scotland he granted the

Range + P:"mat" Range Ben
covenanters all that they demanded, and heaped favours on their

C: Purpose [Text]
leaders, in the hope of persuading them to help him; in return

Ben P:mat Range C: Reason
he gained nothing, for they remained deeply suspicious of

C: Place Carrier P:rel Attribute Actor
him[135]. In Ireland his plans were equally unsuccessful. He

P:"mat" Range C: Accompaniment
opened secret negotiations with the earl of Ormond, the most

powerful protestant noble in the country, who had commanded

C: Time
Strafford's new army until its disbandment in May. In July,

just before leaving for Scotland to try to win over the

Sayer P: verbal Target
covenanters, Charles instructed Ormond and the earl of Antrim

Verbiage C: Accom
to try to re-assemble the new Irish army secretly, evidently

with the intention that they should use it to seize Dublin in

Actor
his name and declare against the English parliament. The

[Text] P:mat Range C: Accomp C:Purp
conspirators also made contact with native Irish leaders to see

if they would agree to serve the king[136].

P:- Senser [Modal] -ment Phenomenon
Did Charles I really expect to get the covenanters and a

largely Catholic Irish army to work together against the

C: Accompaniment
English parliament? With his conviction of his own skill in

[Dir] P:rel [Modal] Attrib
producing political miracles it is certainly possible

Carrier [Text] Range P: mat
that he did; on the other hand the Irish plot does not seem to

Actor C: Quality + [Dir]
have been pursued by him with any great determination, and it

P: rel Token
may be that he intended it only as an expedient to fall back on

\+ C:Comp
if he failed to secure the help of the covenanters. But, as

Possessor
events proved, his rash tampering with an already dangerous

P: rel Possessed
situation in Ireland had results fatal to his reputation.

Phenomenon [Modal]
News that Charles was seeking help in Ireland naturally

P: ment Senser C: Concession
encouraged the Catholics of Ireland. Though they had joined in

[Dir] P:rel Attrib
the prosecution of Strafford with enthusiasm, it was clear

Carrier
that the English parliament, the covenanters, and Strafford's

protestant opponents in Ireland were all much more violently

Attribute
anti-Catholic than the king had ever been. Fearing that their

Actor
position would change for the worse, many native Irish leaders

P: mat C: Time C: Accompaniment
had begun conspiring early in 1641 with Irish exiles on the

C: Time Verbiage
continent. By May an armed rising, to take place late in

P: verbal [Text] C: Time Senser
October, was being discussed. Then in August they, and the

P: ment C: Means Phenomenon
leaders of the Old English, heard through Antrim of his and

Ormond's plan to secure Dublin for the king, and that the king

[Dir] P:rel C: Temp Token
was seeking Irish help. It seemed briefly that the royalist

plot to help the king and the native Irish plots to protect

Actor P: mat Goal
themselves could be combined. The native Irish would help the

\+ P: mat Actor C: Reason
king, and be rewarded and protected by the king for doing so.

\+ [Text] Senser
But in the end the native Irish, 'the fools' as Antrim later

P: ment Phenomenon C: Accompaniment
called them, decided to act on their own, without reference to

Attribute
the king, believing that once they rose in arms the king would

C: Comparison Senser P: ment Phen
support them. Like Ormond and Antrim, they planned to seize

Attribute Range
Dublin, hoping for a bloodless coup d'etat. This part of the

P: mat Beneficiary C: Time
plot was betrayed to the authorities on 22 October 1641, the

\+ Actor
day before it was to have been carried out. But a simultaneous

P: mat C: Comp Actor
rising in Ulster went ahead as planned. Sir Phelim O'Neill

P: mat Goal
occupied the important strong-points of Charlemont and

\+ C: Time C: Qual Token C: Accomp
Dungannon, and within a few days virtually all Ulster except

for the north of counties Down and Londonderry and County

P:rel C: "Place" Actor
Antrim were in the hands of the Irish[137]. The main threat to

C: Time P: mat C: Place
Scottish interests in Ireland now came not from the

regime in Dublin but from the Catholic Irish.

Field: History, No.3
Popular article: "Crime in the 20th Century" (HP3)
Learned article: "Crime, Criminal Justice and Authority in England" (HL3)

Analogous passages

HP3:1 para 1 (Introduction)

Range P:- [Modal]
The history of crime in the twentieth century is inevitably

-mat Actor
dominated by the explosion of criminality in the last thirty

C: Time Actor
years. In the first half of the century, the level of crime

P: mat C: Quality
recorded by the police grew at a much more moderate rate,

C: Time
extending a pattern of slow growth since the 1870s. From 1900

Token P: rel Value Actor
to 1914, the crime level remained constant. Recorded crime

P: mat C: Quality C: Time C: Qual
increased by 5 per cent a year between 1915 and 1930; by 7 per

C: Time C: Comparison
cent between 1930 and 1948 (compared with a post-war annual

Actor
growth rate of 10 per cent and more). The main increases in

P: mat C: "Place"
these early decades occurred in theft and breaking-in offences,

[Comment]
reflecting the growing opportunity for larceny in a more

Actor [Text] P: mat
affluent society. Drunkenness offences, in contrast, declined

C: Qual C: Reason
steeply, owing to tighter licensing laws and changing leisure

C: Comparison
habits, while at the other extreme, the number of murders was

Sayer
lower in the inter-war years than in Victorian times. It all

P: verb Verbiage
suggests that the major economic and political crises of the period -- the First and Second World Wars, the General Strike, the mass unemployment of the Depression years -- had little impact on criminal activity.

HL3:1 para 1 (Introduction)

C: Concession
Despite the central position which the law occupies in pre-and

Range P:- C: Quality -mat C:
modern English society its study was relatively neglected until

Time C: Time [Text] Actor
recently. In the last decade, however, serious and systematic

P: mat Range
research on crime and criminal justice has created a lively and

C: Concession
important part of social history. Regardless of the century

Actor P: mat Range C: Matt
they study, historians have addressed similar questions about the incidence, pattern and character of crime, about the methodologies and approaches appropriate to an assessment of past patterns of criminality, and about the social relationships of authority which are expressed and contested in

Actor P:- C: Quality
crime and the law. No single theme could adequately

-"mat" Goal C: Place Val
encapsulate the diverse published work in this new field. What

[Text] P: rel Token
is evident, however, is an unresolved, and perhaps unresolvable, tension in the use of the records of criminal

Value P: rel Token
justice. The essential dilemma is whether the criminal indictments (the formal charges laid against the accused in the

county quarter sessions and assizes) should be taken as a
measure of the changes which occurred in criminal behaviour
over time, or as an indicator of the contours of criminal

[Dir] Carrier P: rel
justice (cf. Monkkonen, 1979). These two approaches have

Attribute Actor
neither been nor need be mutually exclusive. A study of

P: mat Range
criminal prosecutions yields both a profile of prohibited
conduct and a sketch of the role of the law and judicial

Goal
activity. A positivist interpretation of the criminal

P:- C:Qual -mat C: Means
statistics can only be improved by a conception of criminal
indictments as the end product of an interaction between an
individual act and the structures of social control which

[Text] [Dir] P:ex Existent
define it as criminal. Yet there has been insufficient
readiness to discuss the implications of adopting one or both

C: Time C: Time
of these approaches to studying crime in the past. At times,

[Modal] Actor P: mat Range + C: Place
indeed, historians have adopted both approaches, but in

C: Reporter C: Place Range
separate essays (Cockburn, 1975 and 1977b). In one case, both

P: mat C: Place C: Accomp
approaches have been used in the same monograph, with no
adequate discussion of the inter-connections between them

C: Reporter [Dir] P:rel Value
(Samaha, 1974). It is the tension between the

Token
approaches to the study of crime which will guide and inform

the subsequent estimate of the published literature of the last ten years.

HP3:2 para 4 (Indictable crimes)

Actor
The yearly figure for indictable (or serious) crimes recorded

P: mat C: "Place"
by the police in England and Wales rose from 100,000 in the first decade, to 300,000 in the late 1930s, to half a million

C: Time Actor
in the mid-1950s. From that date the upward trend of crime

P: mat C: Result
accelerated: one million crimes by the mid-1960s, two million by the mid-1970s, and three-and-a-quarter million crimes in

C: Time Range
1984. When the growth in population is accounted for, the

P: mat C: Place Act
pattern of increase in crime is shown in Figures 1 and 2. A

'P:mat C:"Pl"
rate of 249 crimes per 100,000 population in 1901 rose to 2,374

C: Time + C: "Place" C: Time Actor
crimes in 1965 and 6,674 crimes per 100,000 in 1984. The

P: mat C: Time + P: mat
upward trend started during the First World War and has

C: Time C: Accompaniment
continued ever since, apart from a brief period (1946-55) following the Second World War, and in a few years (1972-73,

Range
1978-79) since then. Much less academic and press attention

P:mat Beneficiary
tends to be given to non-indictable (or less serious) offences.

Token
The annual average number of persons found guilty of non-

P: rel Value C: Time
indictable crime was around 650,000 in the first decade of

C: Time Range P:mat
the century; by the mid-1970s, nearly two million persons were

Attrib + Range P: mat Actor P:mat
found guilty and another 136,000 were cautioned. Changes have

C: "Place"
taken place in the types of non-indictable offences, reflecting

Value
changes in social and economic conditions. The largest single

group of non-indictable offences in the Edwardian years for

P:rel Token C: Time
which persons were found guilty was drunkenness; since the

Value P: rel Token
1950s it has been motoring offences.

HL3:2 paras 2-3 (Indictable crimes)

Actor P: mat C:Accom
The present wave of interest in historical crime began with the

naive assertion that, because of the local variations in the

collection of figures, 'criminal statistics have little to tell

C: Reporter Range
us about crime and criminals' (Tobias, 1967). A large

P:- [Text] -mat
proportion of subsequent energies have, nevertheless, been

C: Means
spent utilising time-series to plot the patterns of crime.

[Modal] Value
Of course, the premise upon which the analytic unity of time-

P:rel Token
series relies is that the ratio between recorded and actual

criminality was either fairly constant or changed in an

Attribute
intelligible manner. Encouraged by an optimistic assessment of

the validity of using indictment totals as a guide to change in

Range P: mat
crime (Beattie, 1972), the criminal patterns have been traced

C: "Behalf" C: Reporter +
for the Renaissance period (Samaha, 1974; Cockburn, 1977b) and
C: "Behalf"
for the years 1660-1800, when judicial records became more

C: Reporter Actor P: mat
plentiful (Beattie, 1974). All these studies have examined

Range
counties in close proximity to London, which may not be typical

Actor
of more provincial areas. Samaha's study of Essex, which

restricts itself to serious crime (thereby omitting indictments

for misdemeanour although they comprised a significant

P: mat C: Pl
percentage of cases handled at quarter sessions), points to a

rising crime rate during the reign of Elizabeth I, particularly

C: Condition
between 1589 and 1603. If the demographic data is reliable,

Actor P: mat C: "Place"
the overall crime rate in the county doubled from 7 felonies

C: Accompaniment
per 10,000 people in 1559 to 14 by 1603, with a peak of 36 in

Actor P: mat Range +
1598. Cockburn's essay duplicates the Essex assize data, but

[Text] P: mat Range
also draws upon assize evidence from Hertfordshire and Sussex

C: Purpose
to suggest that crime was indeed increasing during the

C: Concession
Elizabethan years, although from 1600 there was a gradual

[Text] C: Reason
reversal of this upward trend. Finally, on the basis of the

number of accused brought before the grand juries of Surrey and

Sayer P: verb Verbiage
Sussex, Beattie maintains there was a rising total of

indictments between 1660 and 1800 (with a definite peak in the 1720s) in the densely populated urban parishes of north-east

[Text] Senser
Surrey (essentially a part of London). In contrast, the rural parishes of Surrey and the agricultural county of Sussex

P: ment Phenomenon
experienced a decline in crime up to 1770, a trend which was

Actor
reversed thereafter. Further research on different counties

P:- C: Temp -mat Goal
will gradually fill out these incomplete summaries of the crime

Sayer
patterns of early-modern England. Preliminary soundings,

[Text] P: verb Verbiage
however, suggest that an indictment rate for property crime of about 200 per 100,000 in the late sixteenth and early seventeenth centuries, fell to around 50 per 100,000 during the eighteenth century (before climbing back to 200 in the early

[Modal] Token
nineteenth century). Of course, changes in the administration

P: rel Value
of justice were a vital influence upon this pattern, of which more in the next section.

C: Matter Possessor P: rel
For the nineteenth century and onwards the historian has

Possessed C: Time
the benefit of national criminal statistics. From 1857,

Carrier P: rel Attrib C: Comparison
offences known to the police are available, as are offences dealt with by the magistrate in the 'summary' police courts.

Sayer P: verb
An overview of the national trends in recorded crime has

Verbiage
documented a decline in crimes against property and persons

C: Reporter
from the 1840s until the end of the century (Gatrell and

Sayer P: verb Verbiage
Hadden, 1972). A study of London confirms this secular trend

\+ P: mat Range
in crime, and adds the finding that the decline lasted until

the late 1930s, followed by a dramatic increase to the present

C: Reporter Range
day (Gurr et al., 1977). This form of analysis of the official

P: mat C: "Place" C: Qual
published data has been taken as far as it can be in respect of

C: Concession
national movements in crime (although not in respect of trends

Range
in sentencing and in the prison population). Further advances

P: mat [Text] C: "Place"
will be based instead upon regional surveys, especially of the

Token
original court records and newspaper reports. A computer

analysis of some 20,000 committals to trial between 1835 and

P: rel Value
1860 in the Black Country is one such survey, illustrating

that the years 1820 to 1850 mark the high point of disorder

C: Reporter
which began in the aftermath of the Napoleonic Wars (Philips,

1977).

HP3:3 para 5 (Types of offence)

Value
The vast majority (over 90 per cent) of indictable crimes

P:- C: Quality -rel Token
recorded by the police has consistently been offences against

property, notably theft and handling stolen goods and burglary.

Actor
Violent and sexual offences and robbery, although receiving

P:- C: Qual -mat Range
most publicity, have generally accounted for only 5 per cent of

Token
all crime. This distribution of the main categories of crime

P: rel Value C: Time C: Time
has remained much the same throughout the century. In the

[Text] Actor
post-war years, however, crimes of violence and the more

P: mat
organised crimes against property (robbery, burglary) have

C: Qual C: Comparison
increased at a faster rate than that of crime in general.

C: "Place" Token C: Time
Within crimes of violence, the most rapid increase in recent

P: rel C: "Place"
decades has been in malicious woundings, associated with pub

Token
brawls, domestic disputes and violence among adolescents. The

trend in homicides (including murder, manslaughter and

P:-[Text]-rel Value C: Time C:
infanticide) has also been upwards since the early 1960s. From

"Place" Token
around 300 homicides each year in the early 1960s, the current

P:rel Value Goal P; mat C:
average is around 600. The death penalty was abolished for

"Behalf" C: Time + Range
murder in 1965, and the periodic parliamentary attempts to

P: mat C: Concession
bring it back have been resisted, despite the crime's increased

C: "Place"
incidence. In over 40 per cent of homicide offences in 1983,

Token P:rel Value + P: rel
the victim was a member of the suspect's family or was

Value [Comment]
the suspect's lover or co-habitant, a figure which has stayed

C: Time [Dir] P:ex Existent
the same for many years. In 1984 there were eleven victims of

C: Result
homicide per million population, making the risk of being a

murder victim roughly 25 per cent lower than it was a century

Actor P: mat Range
ago. Recent crime statistics reveal a 29 per cent increase in

rape in 1985, part of which is perhaps attributable to greater

public willingness to report rape, in view of more sympathetic

[Dir] P:ex Existent C: Place
police procedures. There were 1,842 recorded rapes in the

C: Time [Comment]
entire country last year, suggesting that Britain is not a

C: Concession
rape-torn society, although estimates differ on the degree to

Value
which official figures understate the incidence of rape. More

P:rel Token
encouraging is that burglary crimes fell by 4 per cent last

year (and by 11 per cent in London).

HL3:3 para 4 (Types of offence)

Actor P:- [Text]-mat
Statistical surveys of the judicial data have also provided

Range
information on the types of criminal offence and on the

relationship between crime and other social and economic

Sayer P: verb Verbiage
variables. All the studies indicate that theft of some kind

(larceny, buglary, robbery) constituted the vast majority of

Actor P: mat Range
indictments. Cockburn (1977b) found that almost one half of
all indicted thieves were accused of stealing merely clothes or

C: Time Token
linen. In the nineteenth century eighty per cent of Black

P;rel C: Reason
Country committals were for larceny, mainly industrial thefts

C: Reporter Carrier P: rel
and thefts of clothing (Philips, 1977). Fatal violence was

Attribute C: Time C: Reporter
extremely uncommon in the Tudor period (Hair, 1972; Cockburn,

C: Time [Dir] P:ex Existent
1977b). In the eighteenth century there was a downward trend

C: Reporter
in indictments for murder and manslaughter (Beattie, 1974).

Actor
An analysis of violent offences in the mid-nineteenth century

P: mat C:"Place" C: Report
points to an extremely low level of illegal homicides (Philips

[Text] Sayer P: verb
1977). Nevertheless, examinations of cases of assault suggest

Verbiage
that violence was a common mode of resolving disputes, either

C: Reporter
individually or collectively (Beattie, 1974; Gatrell and

Sayer [Text] P:verb Verbiage
Hadden, 1972). The studies also refer to the overlap of

[Dir] P: ex Existent
crime and protest. There seems to be no consistent coincidence

C: Place + [Dir] P:ex Existent
between these two forms of behaviour, but there is an

C: Place
apparent association between property offences and political

C: Time C: Reporter
protests in the period of the Industrial Revolution (Gatrell

+ Existent C: Place
and Hadden, 1972), and a correlation between increasing crime

C: Time
and conflict in London in the period 1830-2, 1842-8 and 1916-20

C: Reporter
(Gurr et al., 1977).

HP3:4 para 7 (Types of offender)

Value
The vast majority (around 85 per cent) of offenders found

P:rel Token Token P:rel Value
guilty of indictable crimes are males; the figure is even

C: "Behalf" Carrier P: rel
higher for robbery, wounding and murder. Most crimes are

Attribute [Text] C: Time
the work, moreover, of males under 21 years of age. In 1965,

[Text] Actor P: mat Range
for example, young offenders aged 10-21 accounted for 51 per

cent of male offenders found guilty of indictable offences.

C: Reporter Actor
As Figure 3 shows, the crime rate both for boys aged fourteen

and under seventeen and for young adults aged seventeen and

P: mat C:Qual C: Comparison
under twenty-one has increased faster than for other age

Sayer P: verb Verbiage
groups. Other statistics indicate that these younger age

groups have contributed significantly to the increase in

conviction rates for crimes of violence, robbery and breaking

Actor
and entering. Some of the offenders aged seventeen to twenty-

[Text] P: mat Range
one, furthermore, display serious degrees of recidivism (or

+ P: mat Range C: Matter
repeat criminality), and do so in relation to the

[Dir] P: verb [Text] Verbiage
gravest offences. It should be noted, however, that the
massive increase in police cautioning in recent decades, rather
than 'diverting' young offenders from the courts, has 'widened
[Comment]
the net' as is clear from the fact that the numbers both
Actor P:-
convicted and cautioned have increased. The police are
[Modal] -mat Goal
obviously arresting youngsters who previously they would have
C: Quality [Text] Token
treated informally. To some degree, therefore, the rise in
P: rel Value
juvenile crime in the post-war years is due to the official
[Text]
processing of a wider range of delinquent behaviour. Finally,
[Dir] P:- [Text] -verb Verbiage
it should also be noted that female delinquency is
generating greater cause for concern, and that most young
people evidently grow out of crime, much as they grow out of
spots and pimples.

HL3:4 para 6 (Types of offender)

C: Matter Val
Turning to the sociological details of criminal offenders, the
P:rel Token
most significant finding of published studies is the extent
to which contemporary portrayals of crime and criminals
exaggerate the professionalism of such behaviour and the role
Token P: rel
of 'sub-cultural' formations. Early-modern felons were
C: Frequ Value C: Comparison
ordinarily lone and one-time offenders rather than recidivist

C: Reporter
members of criminal gangs (Samaha, 1974; Cockburn, 1977b) --

[Comment]
a very different image from that to be found in the 'rogue

literature' on the Elizabethan 'underworld' (Salgado, 1977).

Actor P:-[Text]-mat C: "Place"
An examination of the court records has also led to a

correction of the contemporary impression of vagrants and

Goal
vagrancy. The image of large gangs of professional vagabonds,

inhabitants of a distinct sub-culture, participants in

P: mat Actor
organised crime (Pound, 1971), is replaced by that of a sub-

group of the migrant population, composed of young males,

commonly pushed out of forest and pastoral areas by scarcity of

work into the regions of mixed farming in South East England

C: Reporter Range
and the Midlands (Beier, 1974 and 1978; Slack, 1974). This re-

P:-[Text]
evaluation of the stereotype of the criminal offender has also

-mat Actor
been advanced by two important studies of nineteenth century

C: Reporter Sayer
crime (D. Hay et al., 1975a; E.P. THompson, 1975b). They

P: verb Verbiage
stress the difficulty of making a clear-cut division between

C: Place
the working poor and a criminal 'lumpenproletariat'. In these

Possessed P: rel Possessor
essays the eighteenth century offender belongs to the exploited

C: "Place"
labouring poor not some parasitic urban underworld. Behind the

[Text] P: mat
legal definition of a poacher or thief, for example, could lie

Actor
a defence of forest rights or an act of popular price-ficing

C: Reporter Carrier
(Thompson, 1971 and 1975b). Some types of criminality,

[Text] P:rel Attribute
however, were more reliant upon subcultural support.

Actor P: mat C: Place
Sodomites in eighteenth century London constructed around

Range C: Reporter
themselves a kind of protective sub-culture (Trumbach, 1977).

Possessor [Text]
A criminal underworld of master-thieves and receivers also

P: rel Possessed C: Place C: Reporter
seems to have had its locus in the metropolis (Howson, 1970;

McIntosh, 1971).

Actor P: mat Goal
A similar reappraisal has influenced nineteenth century

Range
studies. Both the range of offences committed by vagrants and

P: mat Value
the number of professional vagabonds is being found to be

C: Reporter
smaller than contemporaries believed (Jones, 1977; Vorspan,

Goal
1977). The description of a professional 'criminal class'

P: mat
(Tobias, 1967, 1974 and 1979; Chesney, 1970) is being replaced

Actor
by one of young working men (miners, labourers) regularly

C: Reporter C: Place
supplementing their income by crime (Philips, 1977). In truly

[Dir] C: Freq P:rel
industrialized areas of Victorian England, it again seems

Attribute Carrier
difficult to find any neat distinction between the 'criminal

[Text] [Dir] P: rel
class' and the 'honest respectable poor'. However, it is

Attribute Carrier
possible that the notion of a well-defined hereditary criminal

class might have some validity in enclaves of urban areas, like

C: Report
the 'China' district of Merthyr Tydfil in South Wales (Jones

[Text] [Dir] P: ver Verb-
and Bainbridge, 1979). Moreover, it has been suggested that

-iage
towards the end of the nineteenth century, as contemporary

belief in a separate 'criminal class' broke down in the face of

a more scientific classification of offenders, there existed,

ironically, an older and more recidivist criminal and prison

C: Concession
population than ever before -- although this might be explained

by more efficient police recording of previous convictions

C: Reporter
(Gatrell and Hadden, 1972).

HP3:5 para 8 (Quantitative value of indictments)

Token P: rel
The upward trend of officially recorded crime is not

[Modal] Value
necessarily an accurate reflection of the 'real' level of crime

Actor
or the 'real' rate of its increase. Variations in recorded

P:-[Text]-mat Range
crime rates can often reflect the processes by which crime is

Verbiage
reported and recorded. Most crimes which become known to the

P: verbal Sayer
police are reported by the victim or by members of the public

Sayer [Text] P: verb Verbiage
who witness the crime. Victims often do not report offences,

[Text] C: Reason
however, either because they believe they are trivial (and
around one in four burglary victims loses nothing of value) or
because they think the police will be unable to make an arrest.

[Text] Sayer P:verb C: Place
In contrast, F.H. McClintock argued in Crimes of Violence(1963)

Verbiage
that more of the 'dark figure' of unreported crime was coming
to police attention because violence was less tolerated by the

Goal P:-[Text]
community than formerly. The level of official crime can also

P: mat Actor
be affected by the efficiency of police recording of crime and

[Modal] Sayer
by the pattern of law enforcement. Indeed, the American

C: Time P: verb Verbiage
criminologist, Thorsten Sellin, once declared that 'all
criminal statistics are in fact statistics of law enforcement'.

Actor P: mat [Style] C: Matter
Views differ, in short, as to whether or not the official

Sayer P:verb
statistics can be used to measure criminality. Some say

Verbiage C: Reason
yes, on the assumption that recorded crime is a constant

Sayer P:verb Verbiage C: Reason
proportion of 'real' crime; others say no, on the
grounds that the criminal statistics disclose more about the
mentality and methods of those responsible for law enforcement
than about the incidence and pattern of crime.

HL3:5 paras 13-16 (Quantitative value of indictments)

Actor [Text] P: mat C: Concession
The research literature also undermines, although not always

Goal Range
explicitly, the quantitative worth of indictments. By no means

P: mat C: Means C: Place
all crime was dealt with by way of formal prosecution at

Range P:- C: Freq
quarter sessions and assizes. Criminal behaviour was often

-mat C: Quality C: Means
dealt with, in a preventative manner, by 'presentment' or by

C: Comparison C: Reporter
'recognizance' rather than by indictment (Morrill, 1976;

Token
Ingram, 1977). Cases of poaching, prosecuted under the game

P:rel C: Qual Value
laws, were increasingly the responsibility of magistrates in

C: Reporter
petty sessions (Munsche, 1977; Beattie, 1974; Hay, 1975c;

Range P: mat C: Place
Jones, 1976b). Many moral offences were dealt with in the

C: Reporter
ecclesiastical courts (Marchant, 1969; Houlbrooke, 1979;

[Dir] [Text] P:rel Attribute C: Concession
Sharpe, 1977). It also seems necessary, at least for the

Carrier
early-modern era, to examine the role of civil litigation in

the prosecution of essentially criminal causes, as well as the

C: Reporter
contribution of parochial courts (Ingram, 1977; Munsche, 1977).

Goal [Text] P: mat C: "Place"
Some offenders, moreover, were not brought into contact with

C: Qual Token P: rel
the legal system at all. A prosecution for witchcraft was

[Text] Value C: Time
often the final expression of community action after informal

modes of counteraction (such as the seeking of cures) had been

C: Reporter Range
tried unsuccessfully (Thomas, 1971; McFarlane, 1970). Other

P:-
types of crime, such as assault and domestic violence, could

[Text] -mat [Text] C: Means
also be dealt with first by the methods of arbitration and

unofficial controls available to families and local

communities, the most organized of which was the charivari

C: Reporter
(Bellamy, 1973; Thompson, 1972; Curtis, 1977; Ingram, 1977).

Range [Text] P:-
Such limits to the recourse to prosecution, however, were not

C: Qual -mat Beneficiary C: Result
so readily granted to strangers, thereby increasing the

likelihood of indictment and conviction for those who were not

local residents.

Actor [Text] P: "mat" Goal C:Place
Many of the existing studies also pour scepticism over the

assumption that the criminal indictments represent a fairly

Actor
constant fraction of actual crime. The criminal justice system

P: mat Range Actor P: mat
does not create a mirror image of actual crime; it processes

C: Qual Goal Act [Txt] P:"mat"
only a selective number of offenders. It also dips

C: Place
into the reservoir of unreported crime (the 'dark figure').

Actor
Such active intervention in the regulation of social conduct

P: mat Range
induced short-term, localized fluctuations in the crime rate,

Actor
which the research literature abundantly illustrates. Early-

modern fears that hunger bred a temptation to both crime and

P: mat C: "Place"
disorder seems to have led to a greater readiness to prosecute
[Comment]
in cases of theft, incidentally illustrating how the

association between dearth and high theft rates could be

mediated by a hardening of social attitudes and relationships

C: Reporter Actor
(Walter and Wrightson, 1976). The statistical findings in

[Text] P: mat Range
relation to vagrancy also reflect law enforcement policy

C: Reporter Phenomenon
(Slack, 1974; Jones, 1977). The local maintenance of base

P: ment Senser C: Result
children encouraged seventeenth century communities to select

C: Reporter
infanticidal mothers for prosecution (Wrightson, 1975; Quaife,

Token
1979). The peak of crime (especially riot and assault cases)

C: Time P: rel Value
in the 1720s was a response to the heightened vigilance on

the part of the Whig government towards public order in the

C: Report + P: verb
face of rumours of Jacobite plots (Beattie, 1974), and records,

C:Qual Verbiage
in part, the determination on the part of the ruling groups to

C: Reporter
protect and extend their private property (Thompson, 1975b).

Verbiage
The increase in sodomy cases at the beginning of the nineteenth

P: verbal C: Reason
century has been ascribed to an intensification of fear of

sexual deviance in the face of possible death and defeat at the

C: Reporter
hands of the French (Gilbert, 1976 and 1977; Harvey, 1978).

Token P: rel
The frequency of infanticide between 1840 and 1880 was related,

[Text] Value
in part, to the increasing concern for social welfare to be

C: Reporter Token
found in the popular and medical press (Sauer, 1978). The

P: rel Value
frequency of theft during the same period could be a response

to the determination of employers to crack down upon semi-

C: Reporter + [Text] Actor
customary perquisites (Philips, 1977). And, finally, studies

of popular resistance to the 'New Police' of the nineteenth

century, of the police crusades against street prostitution,

and of the development of notions of juvenile delinquency

P: mat Range
illustrate that local 'crime waves' could be generated by

conscious police efforts, stimulated by middle-class members of

the Puritan lobby, to outlaw street activity which had hitherto

C: Reporter
been accepted (Malcolmson, 1973; Storch, 1975, 1976 and 1977;

Gillis, 1975).

Token
More long-term and widespread changes in the pattern of crime

P: rel Value
could be dependent upon factors such as the public sensitivity

to crime (and the related reluctance of readiness to prosecute)

and the form and efficiancy of the system of prosecution and

[Style] Senser
trial. Broadly speaking, the sixteenth and seventeenth

P: ment Phenomenon
centuries witnessed an expansion of formal justice at quarter

sessions and assizes at the expense of more localized justice.

Actor C: Concession
Samaha's study of Elizabethan Essex (1974) whilst never truly

assessing the nature of the relationship between crime and the

P: "mat" Range
agencies of social control, uncovers a growing demand for order

and a harsher response to lawlessness (which in itself was

Actor
probably a reaction to a real increase in deviance). Grand

P: mat Goal Sayer P: verb Verbiage
juries indicted more offenders; petty juries registered more

C: Time Actor
guilty verdicts. At the same time, reorganization of the court

P: mat Range
system and its bureaucracy ensured that these harsher attitudes

toward lawbreaking could be given effective expression.

Senser C: Comp P: ment Phenomenon
Cockburn (1969, 1975 and 1978) similarly detects a watershed in

C: Reason
criminal administration in the 1580s. In the face of a rising

Actor [Modal] P: mat Range
crime rate, the judges, he feels, may have encouraged an

C: Result
increasingly professional clerical establishment to make such

procedural modifications as to allow fewer challenges to

wrongly-drawn indictments and to speed the dispatch of Crown

C: Reporter C: Time
cases (cf. Gleason, 1969; Langbein, 1974). In the eighteenth

Carrier P: rel
century the decisions of prosecutors, juries and judges were

[Modal] Attribute C: Time
evidently responsive to the level of crime. When the region

Actor P: mat Goal
seemed engulfed by criminality, grand juries sent more

C: Purpose Actor P: mat Goal
defendants to take their trial, petty juries acquitted fewer

+ Actor P: mat C: Quality Value
defendants and judges sentenced more severely. A contrary

[Text] P: rel Token
influence, however, was that grand juries in rural areas

tended to deliver more 'no bill' verdicts in the light of high

C: Reporter + Value
food prices (Beattie, 1974). But by far and away the most

decisive influence upon eighteenth century indictment levels

P: rel Token
was the development of summary hearings either before

Actor
individual magistrates or at petty sessions. Nineteenth

[Text]
century changes in judicial personnel and practice also

P; mat Goal Actor
influenced the secular trend of recorded crime. A transfer of

magisterial authority from the landed to the industrial classes

P:"mat" C: "Place"
between 1836 and 1860 in the Black Country led to a

decisive increase in the recorded number of thefts of iron,

C: Accompaniment
coal and wood, as well as in the number of prosecutions under

C: Reporter Actor
the Master and Servants' Act (Philips, 1976). The expanding

[Text] P: mat
police role in the prosecution of crime also might have

Goal [Modal] Actor
changed the shape of indictment levels. Without doubt, the

Criminal Justice Act of 1855 (empowering the magistrates'

C: Means
courts to deal with many indictable thefts), by providing a

P:"mat"
cheaper and less cumbersome tribunal than quarter sessions, led

C: "Place"
to a vast increase in the number of indictable larcenies which

C: Reporter
were tried either at higher of lower courts (Philips, 1977).

[Text] Actor P: mat C: Concession
In all, historians have produced, at times despite themselves,

Range
a more critical awareness of the limitations of a positivist

approach to the pattern and incidence of crime and the

Token P: rel C: Qual
sociological features of offenders. 'Crime' is in large

Value
part a social judgement of authority, a category created by

Actor
those with the power to pardon or punish. The criminal

P: mat Range
statistics disclose as much about the mentality and methods of

C: Comp
those responsible for the maintenance of authority as about the

[Dir]
pattern and incidence of crime (cf. Nye, 1978; O'Brien, 1978).

Value
Another equally significant result of this critical approach to

P: rel Token
the judicial documents has been a more searching appraisal of

the meaning of criminality, of the function of criminal justice

and the role of law in the development of the state.

HP3:6 para 14 (Socioeconomic variables)

C: Condition
If penal philosophy and the types of punishments used have had

[Text] Token
but a marginal impact on the volume of crime, what about larger

Actor
social and economic forces? London and the big provincial

P: mat Range
cities and towns accounted for over 40 per cent of crime

Token
annually recorded by the police in the 1950s and 1960s; rates

P: rel Value C: Place C: Comp
of crime per head were much higher in urban areas than in

Actor [Text] P: mat C: Qual
rural regions. Urbanisation, however, has increased little

C: Time + [Text] P:- [Modal] -mat Range
since the 1930s, and, hence, can hardly account for the post-

[Modal] Actor
war rise in crime. Indeed, a substantial and growing amount of

P: mat C: Place Phen P:-
crime has occurred in small towns and country areas. Crime is

C: Freq -ment Attrib
often thought to be associated with poverty or social

+ C: Reason
disadvantage. But since improvement in living conditions over

the century, and increased affluence in the post-war decades,

P:- Senser -ment Phen
have not led to a decline in crime, must we not conclude that

Value C: Reas
poverty does not predispose to crime? Not necessarily, since

the absolute level of income is not as crucial as inequalities

Token
of income, which are as marked as ever. The numbers 'feeling'

P: rel Value [Text] Range
poor is what counts. Moreover, a sizeable proportion of

P: C: Time -mat C: Place
children and young persons have always been found in families

C: Condition
whose standard of living is below average. If not poverty per

[Text] Token Senser
se, what of the criminogenic impact of unemployment? Most

P: ment Phenomenon
criminologists have regarded the alteration in Unemployment

C: Role
levels over the century as unrelated to the main changes in the

crime rate, particularly the rise in delinquency in the 1950s

[Text] Range
and 1960s, years of full employment. However, the high levels

of unemployment in the 1930s, especially amongst young people

P: mat
between fourteen and eighteen years of age, has been associated

C: Accomp [Dir] P: ment
with the upward curve of criminality. It remains to be seen

Phenomenon
whether the present high rate of unemployment will worsen the

post-war trend in crime.

HL3:6 para 5 (Socioeconomic variables)

Beneficiary
The relationship between crime and other variables such as

P:- [Text] -"mat" Range
urbanisation and economic conditions has also received some

Sayer P: verb Verbiage
attention. Beattie (1974) stresses the broad differences

Tok
between rural and urban parishes in the eighteenth century. We

P: rel C: Temp Value
are still in need of a study of the association between

crime and the rate of urbanisation in the nineteenth century,

C: Concession
although judging from American studies it is probable that no

association between increased urban crime rates and rapid

Range
urbanisation will be found. The connexion between property

P:- C: Quality
offences and prices (or trade cycle) has been more fully

-mat Actor P: mat Range
examined. Samaha (1974) and Cockburn (1977b) find that

variations in the incidence of theft closely follow the

fluctuations in the price of food, especially in the 1590s.

Phen P: ment C: Role [Text] C: Reason
These must be seen as tentative findings, however, since

inadequate allowance is made for the effect of population

C: Place Sayer
increase on the crime level. In rural Surrey and Sussex both

the short-term and long-term trends of prices and indictments

P: verb Verbiage
(per 100,000 population) suggest a close relationship between

Carrier
want and crime, notably in 1740-1 and 1780-3. The situation in

P:rel Attribute Actor
urban Surrey (London) was more complex. The major peaks in

P: mat Range C: Comparison
indictments follow the conclusion of wars, as in 1714-15, 1747-

Actor [Modal] P: mat Goal
51 and 1802. Rising prices probably heightened the level of

C: Time + Goal P: mat C: Qual
want at these times, but the crime rate was affected more

Actor C: Time
by unemployment as the war effort susided and soldiers were

C: Reporter C: Time
discharged (Beattie, 1974). In the first half of the

Actor
nineteenth century the recorded levels of property crime

P: mat C: Quality C: Reporter
fluctuated inversely with economic activity (Gatrell and

Token
Hadden, 1972; Philips, 1977; Gurr et al., 1977). Offenders

P: rel Value
seem not to have been under any immediate pressure of hunger,

+ C: Time Actor P: mat C: "Place"
but in times of 'distress' (1842, 1848) more took to this

[Style] Token P:- C: Freq
form of self-help. More specifically, poaching seems often

Value - rel C: Reporter C: Time
to have been born of poverty (Jones, 1979). From mid-century,

[Text] Actor P: mat Goal Range
however, this relationship began to reverse itself. Property

C: Accompaniment
crime, as well as assaults and offences involving drunkenness,

P:- C: Frequency -mat C: Accompaniment C: Comp
were increasingly associated with periods of prosperity rather

C: Reporter
than of poverty (Gatrell and Hadden, 1972; Gurr et al., 1977).

HP3:7 paras 18-20 (Alternatives to positivism)

Token
The attempt to find the cause of crime in subcultural value

P: rel Value
systems has ceased to be the predominant concern of

[Text] Actor
sociologists. Instead the social and legal processes by which

P: "mat" C:"Place"
some individuals get 'labelled' as criminal have come under

Attribute
scrutiny. Variously known as 'interactionist' or 'labelling'

Actor P: mat Range
theorists, these sociologists rejected the positivist's view of

Sayer
criminals as identifiably different from non-criminals. They

P:verb Verbiage
urged the need to look at the law-maker and law-enforcer as

Value P:rel Token
much as the law-breaker. Their argument was that the

reactions of the police and courts, at times exacerbated by

press and public fears, confirm and amplify an offender's

[Text] Token P:rel Value
deviance. As such, criminality is not an inherent property

of an individual, but a property conferred by society.

Verbiage P:- [Text] -verbal Sayer
Labelling theory has, in turn, been criticised by 'radical

C: Reason
criminology' for failing to explain the origin as opposed to the development of delinquency, and for presenting criminals as passive victims of official labels, with neither consciousness

Verbiage P:- [Text]-verb C: Reason
nor choice. It has also been criticised for engendering a criminology which, through its emphasis on the marginal world of drug users and homosexuals, fails to deal with the mass of

Senser P: "ment" Phenomenon
property crime. This 'new criminology' favours a shift from studying the 'criminality' of the poor to a concern with the structural framework, particularly the capitalist economic system, which determines the genesis and enforcement of laws,

Carrier P: rel Attribute
and the definition of criminality. It is committed to an analysis of the ways in which criminal laws are deployed to

Carrier P: rel Attrib
maintain class inequalities in society. It is a

C: Comparison
'critical' as distinct from a 'correctionalist' criminology.

Actor P:- [Text] -mat Range C:
Criminologists have also tried to find the causes of crime in

"Place"
the physical and psychological characteristics of individuals.

Actor P: "mat" C: "Place"
'Biogenic' explanations have ranged from criminals as people of inferior intelligence to criminals as males with an extra chromosome in their genetic make-up, which predisposes to

Carrier P:rel [Modal] Attribute
delinquency. Such biological factors are probably most

C: Matter
influential with regard to the small minority of persistent

Possessor P:rel Possessed
offenders. 'Psychogenic' explanations have potentially wider

C: Condition
application. If early childhood 'socialisation' distorts the

Actor P:- [Modal]
development of a stable personality, it can, it is believed,

-mat C: Result Token P:rel Value
result in ant-social conduct. Delinquency is a consequence of

the 'acting out' of guilt and frustration caused by these early

Value [Text] P:rel
experiences. John Bowlby's main hypothesis, for example, was

Token
that the experience of separation of an infant from its mother

Actor P: mat
explained some cases of delinquency. H.J. Eysenck brought

Range C: Place
biology and psychology together in his hypothesis that criminal

and psychopathic behaviour is related to genetically-determined

personality attributes, namely a mixture of extraversion and

[Text] Actor P:"mat" Range
neuroticism. Finally, criminologists have put forward a number

of psycho-social explanations of delinquency, concerning the

Value
family, the school and films and television. The problem with

P: rel Token
all these attempts to pinpoint the causes of crime is that

none explain why most of the people exposed to a broken home or

to a heavy diet of television violence do not commit crimes.

HL3:7 paras 11-12 (Alternatives to positivism)
cf. also 13-16 above

Sources, Concepts and Methods in Historical Crime

Actor P: "mat" C:
The exploration of this new field of social history has led to

"Place"
the recognition that the use of legal data raises important

Actor
conceptual and methodological issues. The word 'crime' itself

C: Time P: mat Range C: Place P:-
still eludes common definition among historians. Should

Actor -mat [Text] Range
the early modern scholar include, for example, the social and

moral delinquencies (drunkenness, sexual lapses, economic

offences) which were dealt with largely by the Church courts?

Actor P: mat Range
An answer to such questions requires the unscrambling of the

different court systems and categories of criminal offence, a

C: Reporter Value
task which is already under way (Baker, 1977a). Another vital

P: rel Token
issue is the worth of court records in documenting forms of

criminal behaviour, types of criminal offender and structures

[Text] [Text] P:- Actor
of social control. To what extent, for example, does the

-mat
availability of discretion to police and prosecutors compromise

Range C: Role
the reliability of indictment statistics as an index to changes

Actor
in the level of criminality? The published literature

P: mat Range
illustrates that historians have developed a critical awareness

+ P:-
of some of the limitations of their documentation, and have

C: Temp -mental Phenomenon
gradually started to heed the lesson of contemporary
criminology that a full understanding of historical crime has
to encompass not only the deviant act but also the procedures
and dynamics of law enforcement.

[Text] Actor P: mat Range
For a start, historians have initiated a critical assessment of
the reliability of the extant records (notably indictment

C: Time
files) when it comes to factors like the social status or

C: Reporter
domicile of the offender. According to Cockburn (1972 and

Token P: rel
1975), a majority of early-modern assize indictments are

Value C: Quality
factually worthless with regard to occupation of the accused

[dir]
and his place of abode (cf. Wiener, 1976; Baker, 1977b).

Verbiage P:verb C: Role [Text] C: Reason
Vagrants were described as 'labourers', for example, because it
was legally unacceptable to insert a status in a legal document

Token
which was forbidden by law. The stated domicile of the

P: rel C: Freq [Modal] Value
offender was often in fact the place where the crime

Range P: "mat" C: "Place"
occurred. Similar doubts have been cast over the date of the

Range P:-[Text]-P-
offence. The factual reliability of the records has thus been

C: Qual -"mat" Sayer P: verb [Text] Verbiage
severely undermined. It suggests, at least, the
modification of the sociological analysis completed by Samaha
(1974) and by Cockburn himself (1977b) relating to the social

status of offenders, criminal mobility and the seasonal incidence of crime.

HP3:8 para 21-22 (Conclusion)

Actor
The search for predisposing factors in the genesis of

P: mat [Text] P:-
delinquent behaviour will continue. What other avenues should

Actor -mat
future research go down?

Range P: "mat" Beneficiary
More attention should be given to the times (particularly between 1946 and 1955) when the rise in crime slackened or was

Range P: mat C: "Place"
reversed. More work is needed on groups amongst whom crime has remained comparatively rare, like females, and on groups who have been relatively overlooked, like white-collar criminals.

Actor
The search for the effect on delinquency of increases in affluence or of movements in the unemployment level in previous

P: mat C: Concession
decades should continue, although improved research strategies

+ [Text] Range
are probably required. And, lastly, the essentially historical questions posed by the 'new criminologists', including the processes by which criminal laws and policies are enacted, and the contrasts in the criminal codes of different socioeconomic

P: mat C: Purpose
systems, must be confronted in order to uncover the structural forces in the creation of crime.

HL3:8 paras 25-26 (Conclusion)

Range P:-
Faith in the positivist procedure of quantification has been

C: Qual -mat C: Time
considerably undermined since the days of historical research

Actor C: Time P: mat Range
into crime. Many historians still present the judicial data

C: Role
as a valid representation of the incidence and pattern of

crime, and the social status and geographical distribution of

\+ [Dir] P: rel Attribute
criminals and victims. But it has become more and more

Carrier
evident that the information to be derived from the legal

records can be factually unreliable and, anyway, is a record

not only of deviant actions but also of the attitudes of the

Value
propertied to deviance as expressed in law enforcement. The

P: rel Token
alternative historical approach has been to use the

documentation as a guide to changes in the administration of

justice, as a searchlight on particular social relationships,

and as essential clues both to popular attitudes to the

[Dir]
official legal code and to the role of law in society. It

P: rel C: Place Token
is in this work that we have come closest to the

construction of social theory, notably a Marxist analysis of

crime and the law in capitalist social and political

Range P:- C:Tim
structures. Further concrete historical investigation is now

-mat C: Purpose
needed to test the strength of these conceptual frameworks.

[Dir] P:rel Attribute
It would be detrimental to the social history of crime,

[Text] C: Condition
however, if this tendency to focus on the characteristics and

role of the legal system supplanted investigations of

developments in forms of criminal behaviour, by which is meant

[Text] [Dir] P:rel
both unrecorded as well as recorded crimes. For it is

C: "Place"
only on the basis of this latter evidence, albeit imperfect,

Token
that we can reach discerning judgements about the legitimacy of

the law.

C: Comparison Actor P: mat C: Qual
As with any new discipline the subject has developed rather

Carrier P:rel Attribute
haphazardly. Existing studies are spatially limited,

treating only a few counties or regions, and often those

[Text]
closest to the distorting influence of London. In part,

[Text] Range P: mat Actor
however, this situation has been determined by the survival of

[Dir] P:- [text] -ex Existent
court records. There has also been insufficient uniformity

C: Place
in such basic methods as the construction of crime rates and

[Modal] [Text]
the validation of statistical findings. Inevitably, too,

Range P: mat Range
innumerable research topics have been neglected. More

P: "mat" Beneficiary
attention needs to be given to the factors which have led to

the creation of particular criminal laws, to the differential

enforcement of those laws, as well as to the alterations in the

Phenom P: ment
definition of crimes engendered by case law. Little is

C: Time P: ment C: Matter
yet known about distinct categories of offenders,

including juvenile, 'white collar' and persistent ciminals.

Carrier P: rel
The efficiency and routinization of the judicial process would

Attribute C: Condition
be easier to gauge if we knew more about the changing ratios

between known crime, arrests, commitals to trial and

+ [Text] Range P: mat C: Matter
convictions. And finally, more is needed on the principles

and practices of sentencing and on the changing rates of

C: Conc Actor P: mat
punishment. Even so, the state of the subject has developed

C: Qual C: Time C: Result
sufficiently in the last decade to allow valuable exchanges to

take place between historians working in different centuries

(as witness the conference of the Social History Society,

'Crime, Violence and Social Protest') and in different

countries (as witness the conference organized by the Dutch

group for the Study of the History of Crime and the Criminal

Actor
Law). A comparative approach to the assessment of past

P: "mat" Range C: Qual C:
patterns of criminality will advance the subject enormously, as

Condition
long as scrupulaous attention is paid to the uniqueness of

[Text] C: Condition
historical detail and context. For if there is one precept

Value P: rel Token
to which the historian should cleave, it is that the

definition and development of crime are formations of distinct economic and cultural formations.

Appendix C: Thematic Profiles

The following tables give an indication of the types of participant and circumstance found as topical themes, as well as the types of textual and modal themes, in the extracts from each corresponding pair of popular and learned articles. At the top of each table, the total number of themes in each extract is given (popular/learned). The figures below show the percentage of thematic types which constitute that figure. These figures are rounded off to the nearest percentage or 0.5%.

Thematic profile: Extracts: BP1/BL1

Theme type			1	2	3	4	5	6	7	8	9	Total
Number of themes in extracts:			27/29	10/9	9/9	7/8	40/10	5/32	5/3	9/14	4/11	116/125
% Topical themes (ideational):												
Participant types:	material		15/10	20/22	22/33	29/62	27½/30	20/28	60/33	33/43	0/18	24/27
	relational		18/31	30/33	11/44	28/0	20/30	60/25	0/0	33/21	25/36	22/26
	verbal		7/10	0/33	11/11	0/25	2½/1	0/3	0/0	0/7	0/9	3/10
	mental		4/14	10/0	22/0	0/0	2½/0	0/0	0/0	11/7	0/9	5/5
	behavioral		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Circumstance: types	extent:	space	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		time	4/0	0/0	0/0	0/0	0/0	0/0	0/0	0/14	0/0	1/2
	location:	space	7/10	0/11	0/0	0/12	12½/0	0/9	0/33	0/0	0/0	6/7
		time	26/3	0/0	0/0	0/0	0/10	0/3	0/0	0/0	25/0	7/2
	manner:	means	0/0	0/0	11/0	0/0	0/10	0/0	0/0	0/0	0/0	1/1
		quality	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		comparison	0/0	0/0	0/0	0/0	7½/0	0/0	0/0	0/0	0/0	3/0
	cause	reason	0/0	0/0	0/0	0/0	0/0	0/3	0/0	0/0	0/0	0/1
		purpose	0/0	0/0	0/0	0/0	5/0	0/0	0/0	0/0	0/0	2/0
		behalf	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	accompaniment		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	matter		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	role		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	concession		0/3	10/0	0/0	0/0	0/0	0/3	0/0	0/7	0/0	1/2
	reporter		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/9	0/1
	frequency		7/0	0/0	0/0	0/0	3/0	0/3	0/0	0/0	0/0	3/1
	condition		0/0	0/0	0/0	3/0	0/0	0/0	0/0	0/0	0/0	1/0
	result		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	contrast		0/0	0/0	0/0	0/0	0/10	0/0	0/0	0/0	0/0	0/1
% Textual themes:												
	existential		0/0	3/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0
	directive		7/0	0/0	0/0	0/0	2½/0	0/6	0/0	0/0	25/0	3/2
	cohesive:		3/17	10/0	22/11	28/0	17½/10	20/9	0/0	22/0	25/9	15/9
	question:	polar	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		wh-	0/0	0/0	0/0	0/0	0/0	0/0	20/0	0/0	0/0	1/0
% Modal themes (interpersonal):												
	attitudinal:		0/0	10/0	0/0	0/0	0/0	0/6	0/33	0/0	0/0	1/2
	style:		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/9	0/1

Thematic profile: Extracts: BP2/BL2

Theme type			1	2	3	4	5	Total
Number of themes in extracts:			43/23	27/3	14/14	11/30	44/6	139/76
% Topical themes (ideational):								
Participant types:	material		32/39	48/33	43/57	36/40	25/17	34/41
	relational		14/17	4/0	21/21	0/13	16/17	12/14
	verbal		5/0	11/0	0/0	18/3	0/17	5/3
	mental		2/0	0/33	14/0	18/10	9/0	6/4
	behavioural		0/4	0/0	0/0	0/0	0/0	0/1
Circumstance types:	extent:	space	0/0	0/0	0/0	0/0	0/0	0/0
		time	0/0	0/0	0/0	0/0	0/0	0/0
	location:	space	0/0	4/0	7/14	0/0	0/0	1/3
		time	5/0	4/0	0/0	0/0	0/17	2/1
	manner:	means	0/0	4/0	7/7	0/3	0/17	1/4
		quality	0/0	0/0	0/0	0/0	0/0	0/0
		comparison	0/0	7/0	0/0	0/10	2/0	2/4
	cause	reason	0/4	0/0	0/0	0/0	0/0	1/0
		purpose	0/0	0/33	0/0	0/0	0/0	0/1
		behalf	0/0	0/0	0/0	0/0	0/0	0/0
	accompaniment		0/0	0/0	0/0	0/0	0/0	0/0
	matter		0/0	0/0	0/0	0/0	0/0	0/0
	role		0/0	0/0	0/0	0/0	0/0	0/0
	concession		2/0	4/0	0/0	0/0	7/0	3/0
	reporter		0/0	0/0	0/0	0/0	0/0	0/0
	frequency		0/0	0/0	0/0	0/0	2/0	1/0
	condition		5/0	0/0	7/0	0/3	7/0	4/1
	result		0/0	0/0	0/0	0/0	0/0	0/0
	contrast		0/0	0/0	0/0	0/0	2/0	1/0
% Textual themes:								
	existential		0/4	4/0	0/0	0/0	0/0	1/1
	directive		0/0	0/0	0/0	0/7	0/17	0/4
	cohesive:		23/30	11/0	0/0	27/7	18/0	17/12
	question:	polar	0/0	0/0	0/0	0/0	0/0	0/0
		wh-	12/0	0/0	0/0	0/3	11/0	7/1
% Modal themes (interpersonal):								
	attitudinal:		0/0	0/0	0/0	0/0	0/0	0/0
	style:		0/0	0/0	0/0	0/0	0/0	0/0

Thematic profile: Extracts: BP3/BL3

Theme type			1	2	3	4	Total
Number of themes in extracts:			24/44	4/40	17/8	13/10	58/102
% Topical themes (ideational):							
Participant types:	material		21/36	25/22	6/25	31/20	19/28
	relational		21/18	0/20	23/12	23/10	21/18
	verbal		4/0	0/2	0/0	0/20	2/3
	mental		4/4	0/0	18/12	0/10	7/4
	behavioral		0/0	0/0	0/0	0/0	0/0
Circumstance types:	extent:	space	0/0	0/0	0/0	0/0	0/0
		time	0/0	0/0	0/0	0/0	0/0
	location:	space	0/4	0/5	0/0	0/0	0/4
		time	21/4	25/2	12/25	0/0	14/5
	manner:	means	0/0	0/0	0/0	0/0	0/0
		quality	0/0	0/0	0/0	0/0	0/0
		comparison	0/0	0/2	0/0	0/0	0/1
	cause	reason	0/0	0/0	0/0	0/0	0/0
		purpose	0/0	0/0	0/0	0/0	0/0
		behalf	0/0	0/0	0/0	0/0	0/0
	accompaniment		0/0	0/0	0/0	0/0	0/0
	matter		0/0	0/0	0/0	0/0	0/0
	role		0/0	0/0	0/0	0/0	0/0
	concession		4/0	0/2	0/0	0/10	2/2
	reporter		0/0	0/0	0/0	0/0	0/0
	frequency		0/0	0/7	6/0	0/0	2/3
	condition		0/0	0/5	6/0	0/0	2/2
	result		0/0	0/0	0/0	0/0	0/0
	contrast		0/0	0/2	0/0	0/0	0/0
% Textual themes:							
	existential		0/4	0/2	0/0	8/0	2/3
	directive		4/2	25/2	6/0	23/0	10/2
	cohesive:		21/23	25/17	12/25	15/20	17/20
	question:	polar	0/0	0/0	0/0	0/0	0/0
		wh-	0/0	0/2	0/0	0/10	2/1
% Modal themes (interpersonal):							
	attitudinal:		0/0	0/2	12/0	0/0	3/1
	style:		0/0	0/0	0/0	0/0	0/0

Thematic profile: Extracts: CP1/CL1

Theme type	1	2	3	4	5	Total
Number of themes in extracts:	18/13	43/35	32/46	11/6	21/12	125/112
% Topical themes (ideational):						
Participant types: material	39/0	39/14	41/35	18/33	19/17	34/22
relational	17/23	16/9	19/24	9/17	14/25	16/19
verbal	5/23	9/11	3/2	18/0	0/25	6/10
mental	0/0	5/14	3/4	0/0	0/0	2/6
behavioural	0/0	0/0	0/0	0/0	0/0	0/0
Circumstance types: extent: space	0/0	0/3	0/0	0/0	0/0	0/1
time	0/0	0/0	12/6	0/0	0/0	3/3
location: space	0/8	2/3	6/2	9/0	9/8	5/3
time	0/8	0/0	3/0	0/0	5/0	2/1
manner: means	0/0	0/0	0/0	0/0	0/0	0/0
quality	0/0	0/3	0/0	0/0	0/0	0/1
comparison	0/0	0/0	0/0	0/0	0/0	0/0
cause reason	0/0	0/0	0/0	0/0	0/0	0/0
purpose	0/0	0/0	0/0	0/0	0/0	0/0
behalf	0/0	0/0	0/0	0/0	0/0	0/0
accompaniment	5/0	0/0	0/0	0/0	0/0	1/0
matter	0/0	0/3	0/0	0/0	0/0	0/1
role	0/0	0/0	0/0	0/0	0/0	0/0
concession	5/0	0/0	0/0	0/0	0/0	1/0
reporter	0/0	0/3	0/0	0/0	0/0	0/0
frequency	0/0	0/0	0/0	0/0	0/0	0/0
condition	0/0	2/6	0/4	9/0	9/8	3/4
result	0/0	0/0	3/0	0/0	0/0	1/0
contrast	0/0	0/0	0/0	0/0	0/0	0/0
% Textual themes:						
existential	0/0	0/3	0/0	0/0	0/0	0/1
directive	0/0	0/3	0/4	27/0	0/0	2/3
cohesive:	17/30	21/20	9/15	0/50	28/17	17/20
question: polar	0/0	0/0	0/0	0/0	0/0	0/0
wh-	0/0	5/0	0/0	9/0	0/0	2/0
% Modal themes (interpersonal):						
attitudinal:	11/0	0/3	0/2	0/0	0/0	1/1
style:	0/8	0/0	0/0	0/0	0/0	0/1

Thematic profile: Extracts: CP2/CL2

Theme type			1	2	3	4	5	6	Total
Number of themes in extracts:			10/5	30/22	11/11	8/7	27/41	7/17	93/103
% Topical themes (ideational):									
Participant types:	material		40/0	17/4	45/27	25/43	22/36	14/47	25/29
	relational		20/40	13/18	27/9	25/14	15/17	28/6	18/15
	verbal		0/0	0/14	0/0	0/0	0/2	0/0	0/4
	mental		30/20	17/9	9/18	0/0	0/7	0/0	10/8
	behavioural		0/0	0/0	0/0	0/0	0/0	0/0	0/0
Circumstance types:	extent:	space	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		time	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	location:	space	0/0	0/4	0/0	0/0	0/2	0/0	0/2
		time	0/0	3/0	0/0	25/0	18/9	0/0	9/2
	manner:	means	0/0	0/0	0/0	0/0	0/2	0/0	0/1
		quality	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		comparison	0/20	0/4	0/0	0/0	0/5	0/0	0/4
	cause	reason	0/0	3/4	0/9	0/0	0/0	0/0	1/2
		purpose	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		behalf	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	accompaniment		0/0	3/0	0/0	0/0	0/0	0/0	1/0
	matter		0/0	0/0	0/0	0/0	0/0	0/0	0/0
	role		0/0	0/0	0/0	0/0	0/0	0/0	0/0
	concession		0/0	3/0	9/9	0/0	0/0	0/0	2/1
	reporter		0/0	0/0	0/0	0/0	0/0	0/0	0/0
	frequency		0/0	0/4	0/0	0/0	4/0	0/0	1/1
	condition		0/0	3/0	0/0	0/0	11/0	0/0	4/0
	result		0/0	0/0	0/0	0/0	0/0	0/0	0/0
	contrast		0/0	3/0	0/0	0/0	0/0	0/0	1/0
% Textual themes:									
	existential		0/0	3/0	0/0	0/0	0/0	14/0	2/0
	directive		0/0	3/4	0/9	0/28	4/0	14/6	3/5
	cohesive:		0/20	13/32	9/18	12/14	22/19	28/41	15/25
	question:	polar	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		wh-	0/0	0/0	0/0	0/0	0/0	0/0	0/0
% Modal themes (interpersonal):									
	attitudinal:		10/0	13/0	0/0	12/0	4/2	0/0	7/1
	style:		0/0	0/0	0/0	0/0	0/0	0/0	0/0

Thematic profile: Extracts: CP3/CL3

Theme type			1	2	3	4	5	Total
Number of themes in extracts:			19/11	13/13	5/8	23/24	7/17	84/90
% Topical themes (ideational):								
Participant types:	material		21/27	15/15	60/37	35/62	14/0	21/25
	relational		21/27	8/38	40/12	35/12	57/23	23/18
	verbal		0/9	0/0	0/0	0/4	0/0	0/2
	mental		0/0	15/0	0/12	0/4	0/0	2/2
	behavioural		0/0	0/0	0/0	0/0	0/0	0/0
Circumstance types:	extent:	space	0/18	0/0	0/0	0/0	0/0	0/2
		time	0/18	15/15	0/0	4/0	0/0	3/4
	location:	space	0/0	0/0	0/0	0/0	0/12	0/2
		time	0/0	0/0	0/0	0/4	0/6	0/2
	manner:	means	0/0	0/0	0/0	0/0	0/0	0/0
		quality	0/0	8/0	0/0	4/0	0/0	2/0
		comparison	0/0	0/0	0/0	0/0	0/0	0/0
	cause	reason	0/0	0/8	0/0	4/0	0/0	1/1
		purpose	5/0	0/0	0/0	0/4	0/0	1/1
		behalf	0/0	0/0	0/0	0/0	0/0	0/0
	accompaniment		0/0	0/0	0/0	0/0	0/0	0/0
	matter		0/0	0/0	0/0	0/4	0/0	0/1
	role		0/0	0/0	0/0	0/0	0/0	0/0
	concession		0/0	0/0	0/0	0/0	0/6	0/1
	reporter		0/0	0/0	0/0	0/4	0/0	0/1
	frequency		5/0	0/0	0/0	0/0	0/6	1/1
	condition		10/0	15/0	0/12	9/0	0/0	7/1
	result		0/0	0/0	0/0	0/0	0/0	0/0
	contrast		0/0	0/0	0/0	4/0	0/0	1/0
% Textual themes:								
	existential		16/0	0/15	0/12	0/0	0/0	3/3
	directive		0/0	0/0	0/0	0/0	14/12	1/2
	cohesive:		21/0	23/8	0/12	4/0	14/23	11/7
	question:	polar	0/0	0/0	0/0	0/0	0/0	0/0
		wh-	0/0	0/0	0/0	0/0	0/0	0/0
% Modal themes (interpersonal):								
	attitudinal:		0/0	0/0	0/0	0/0	0/12	0/2
	style:		0/0	0/0	0/0	0/0	0/0	0/0

Thematic profile: Extracts: HP1/HL1

Theme type			1	2	3	4	5	6	Total
Number of themes in extracts:			23/7	10/15	27/65	24/20	17/17	12/12	113/136
% Topical themes (ideational):									
Participant types:	material		30/0	30/33	33/28	21/50	23/18	50/33	30/29
	relational		22/28	20/7	4/11	29/5	18/23	17/8	18/12
	verbal		0/0	0/0	4/0	0/0	0/0	0/0	1/0
	mental		9/0	20/0	11/5	0/0	6/6	0/0	7/3
	behavioural		0/0	0/0	0/0	0/0	0/0	0/0	0/0
Circumstance types:	extent:	space	0/0	0/0	4/0	0/0	0/0	0/8	1/1
		time	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	location:	space	0/0	0/13	7/15	8/5	12/12	0/17	5/12
		time	0/42	10/13	7/8	8/15	0/0	8/0	5/9
	manner:	means	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		quality	0/0	0/0	0/0	0/0	6/0	0/0	1/0
		comparison	4/0	0/0	0/0	0/0	0/0	0/0	1/0
	cause	reason	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		purpose	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		behalf	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	accompaniment		0/0	0/0	0/0	0/0	0/0	0/0	0/0
	matter		0/0	0/0	0/0	0/0	0/0	0/0	0/0
	role		0/0	0/0	0/0	0/0	0/0	0/0	0/0
	concession		0/0	0/0	0/0	0/5	0/6	0/0	0/1
	reporter		0/0	0/0	0/0	0/0	0/0	0/0	0/0
	frequency		0/0	0/0	0/0	0/0	0/0	0/0	0/0
	condition		4/0	0/0	0/0	0/0	0/0	0/0	0/0
	result		0/0	0/0	0/0	0/0	0/0	0/8	0/1
	contrast		0/0	0/0	0/0	0/0	0/0	0/0	0/0
% Textual themes:									
	existential		0/0	0/0	0/0	4/0	0/6	0/8	1/1
	directive		0/0	0/7	0/3	0/0	6/0	0/0	1/2
	cohesive:		22/28	20/27	30/31	25/20	29/29	25/17	26/27
	question:	polar	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		wh-	9/0	0/0	0/0	0/0	0/0	0/0	2/0
% Modal themes (interpersonal):									
	attitudinal:		0/0	0/0	0/0	1/0	0/0	0/0	1/0
	style:		0/0	0/0	0/0	0/0	0/0	0/0	0/0

Thematic profile: Extracts: HP2/HL2

Theme type			1	2	3	4	5	Total
Number of themes in extracts:			11/17	29/7	7/13	19/56	22/58	88/151
% Topical themes (ideational):								
Participant types:	material		18/18	31/28	28/23	21/18	14/31	23/24
	relational		0/12	7/0	14/15	0/7	9/0	6/5
	verbal		0/12	0/0	0/8	0/5	0/0	0/4
	mental		9/0	7/28	14/8	10/11	4/2	8/6
	behavioural		0/0	0/0	0/0	0/0	0/0	0/0
Circumstance types:	extent:	space	0/0	0/0	0/0	0/0	0/0	0/0
		time	0/0	0/0	0/0	0/0	0/0	0/0
	location:	space	0/6	3/0	0/0	5/2	4/7	3/4
		time	18/29	3/28	14/8	11/9	32/17	15/15
	manner:	means	0/0	0/0	0/0	0/0	0/0	0/0
		quality	0/0	0/0	0/0	0/0	0/0	0/0
		comparison	0/0	0/0	0/0	5/2	0/3	1/2
	cause	reason	0/0	7/0	0/0	0/0	9/2	4/1
		purpose	0/0	0/0	0/0	5/0	0/0	1/0
		behalf	0/0	0/0	0/0	0/0	0/0	0/0
	accompaniment		0/0	0/0	0/0	0/0	0/0	0/0
	matter		0/0	0/0	0/0	0/0	0/0	0/0
	role		0/0	3/0	0/0	0/0	0/0	1/0
	concession		9/0	0/0	0/0	0/0	0/5	1/2
	reporter		0/0	0/0	0/0	0/0	0/0	0/0
	frequency		0/0	0/0	0/0	10/0	0/0	2/0
	condition		0/0	0/0	0/0	0/11	0/0	0/1
	result		0/0	0/0	0/0	0/0	0/0	0/0
	contrast		0/0	0/0	0/0	0/2	0/0	0/1
% Textual themes:								
	existential		0/0	0/0	0/0	5/0	0/0	1/0
	directive		0/0	0/0	0/8	0/5	4/5	1/5
	cohesive:		36/12	38/14	28/23	26/32	23/24	31/25
	question:	polar	0/0	0/0	0/0	0/0	0/2	0/1
		wh-	9/0	0/0	0/0	0/0	0/0	1/0
% Modal themes (interpersonal):								
	attitudinal:		0/12	0/0	0/8	0/3	0/2	0/4
	style:		0/0	0/0	0/0	0/0	0/0	0/0

Thematic profile: Extracts: HP3/HL3

Theme type			1	2	3	4	5	6	7	8	Total
Number of themes in extracts:			7/14	14/27	16/14	13/19	12/53	19/20	24/15	8/27	113/189
% Topical themes (ideational):											
Participant types:	material		57/21	43/33	31/36	23/37	25/53	26/28	37/47	62/26	35/37
	relational		0/21	14/11	19/7	23/16	8/19	10/20	37/13	0/11	18/15
	verbal		14/0	0/7	0/7	0/5	50/0	0/5	4/13	0/0	7/4
	mental		0/0	0/4	0/0	0/0	0/4	10/5	4/0	0/4	3/3
	behavioural		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Circumstance types:	extent:	space	0/0	0/0	19/0	8/16	0/2	0/0	0/7	0/4	4/3
		time	0/0	0/4	0/0	0/0	0/0	0/5	0/0	0/0	0/1
	location:	space	0/7	0/0	0/0	0/0	0/0	0/15	0/0	0/0	0/2
		time	28/7	28/4	12/14	8/0	0/6	0/0	0/0	0/0	8/4
	manner:	means	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		quality	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		comparison	0/0	0/0	0/0	8/0	0/0	0/0	0/0	0/4	1/0
	cause	reason	0/0	0/7	0/0	0/0	0/2	5/0	0/0	0/0	1/1
		purpose	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		behalf	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	accompaniment		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	matter		0/0	0/0	0/0	0/5	0/0	0/0	0/0	0/0	0/0
	role		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	concession		0/14	0/0	0/0	0/0	0/0	0/0	0/0	0/4	0/1
	reporter		0/0	0/0	0/0	0/0	0/0	0/0	0/7	0/0	0/0
	frequency		0/7	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	condition		0/0	0/4	0/0	0/0	0/0	10/0	4/0	0/4	3/1
	result		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	contrast		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
% Textual themes:											
	existential		0/7	0/0	6/14	0/0	0/0	0/0	0/0	0/4	1/2
	directive		0/7	0/0	0/0	15/10	0/2	5/0	0/0	0/15	3/4
	cohesive:		0/7	14/18	12/21	15/10	17/9	26/10	12/7	25/22	16/13
	question:	polar	0/0	0/0	0/0	0/0	0/0	0/0	0/7	0/0	0/0
		wh-	0/0	0/0	0/0	0/0	0/0	0/0	0/0	12/0	1/0
% Modal themes (interpersonal):											
	attitudinal:		0/0	0/7	0/0	0/0	0/2	5/0	0/0	0/4	1/2
	style:		0/0	0/0	0/0	0/0	0/2	0/5	0/0	0/0	0/1

Appendix D

Summary of Process, Participant and Circumstance Types in the Matched Extracts

Key

P: Popular article

L: Learned article

Total: Number of process/participant/circumstance types in the matched extract

%age: Proportion of process/participant/circumstance type as a percentage of the total number of processes/participants or circumstances in the extract

Texts: BP1/BL1

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mat	51	50.4	43	41.3	Actor	47	26.1	32	17.0
					Range	19	10.55	29	15.4
					Goal	15	8.3	5	2.6
					Beneficiary	1	0.55	2	1.1
					Attribute	2	1.1	0	0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
relat	34	33.7	38	36.5	Token	18	10	19	10.1
					Value	18	10	19	10.1
					Carrier	11	6.1	16	8.5
					Attribute	11	6.1	16	8.5
					Possessor	3	1.7	3	1.6
					Possessed	4	2.2	3	1.6

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
verbal	5	4.95	12	11.5	Sayer	5	2.8	10	5.3
					Verbiage	5	2.8	12	6.4
					Receiver	4	2.2	0	0
					Target	0	0	4	2.1

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mental	8	7.9	10	9.6	Senser	6	3.3	6	3.2
					Phenomenon	8	4.4	10	5.3
					Attrib	0	0	1	0.5

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
exist	3	2.8	1	0.9	Existent	3	1.7	1	0.5

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
behav	0	0	0	0	Behaver	0	0	0	0

Texts: BP1/BL1

Circumstances	P Total	P %age	L Total	L %age
Extent: Spatial	1	1.3	2	2
Temporal	3	3.8	4	3.9
Location: Place	36	46.1	26	25.5
Time	7	9	7	6.9
Manner: Means	1	1.3	1	1
Quality	5	6.4	8	7.8
Comparison	6	7.7	4	3.9
Cause: Reason	1	1.3	4	3.9
Purpose	4	5.1	1	1
Behalf	0	0	0	0
Accompaniment	1	1.3	5	4.9
Matter	0	0	3	2.9
Role	1	1.3	0	0
Concession	1	1.3	5	4.9
Reporter	0	0	28	27.45
Frequency	5	6.4	3	2.9
Condition	3	3.8	1	1
Result	2	2.6	0	0

Summary	BP1	BL1
Total number of processes:	101	104
participants	180	188
circumstances	78	102

Texts: BP2/BL2

Process	P		L		Participants	P		L	
	Total	%age	Total	%age		Total	%age	Total	%age
mat	58	52.2	45	61.6	Actor	49	24.7	28	23.9
					Range	26	13.1	25	21.4
					Goal	16	8.1	8	6.8
					Beneficiary	1	0.5	2	1.7
					Attribute	2	1.0	1	0.8

Process	P		L		Participants	P		L	
	Total	%age	Total	%age		Total	%age	Total	%age
relat	31	28	19	26	Token	20	10.1	12	10.2
					Value	16	8.1	11	9.4
					Carrier	8	4	5	4.3
					Attribute	8	4	5	4.3
					Possessor	7	3.5	1	0.8
					Possessed	7	3.5	2	1.7

Process	P		L		Participants	P		L	
	Total	%age	Total	%age		Total	%age	Total	%age
verbal	13	11.7	3	4.1	Sayer	9	4.5	3	2.6
					Verbiage	13	6.6	3	2.6
					Receiver	0	0	1	0.8
					Target	3	1.5	0	0

Process	P		L		Participants	P		L	
	Total	%age	Total	%age		Total	%age	Total	%age
mental	8	7.2	4	5.5	Senser	3	2.5	3	2.6
					Phenomenon	7	3.5	4	3.4
					Attribute	0	0	1	0.8

Process	P		L		Participants	P		L	
	Total	%age	Total	%age		Total	%age	Total	%age
exist	1	0.9	1	1.4	Existent	1	0.5	1	0.8

Process	P		L		Participants	P		L	
	Total	%age	Total	%age		Total	%age	Total	%age
behav	0	0	1	1.4	Behaver	0	0	1	0.8

Texts: BP2/BL2

Circumstances	P		L	
	Total	%age	Total	%age
Extent: Spatial	0	0	0	0
Temporal	0	0	0	0
Location: Place	16	18.4	18	32.7
Time	7	8	5	9.1
Manner: Means	8	9.2	11	20
Quality	9	10.3	3	5.4
Comparison	8	9.2	3	5.4
Cause: Reason	5	5.7	4	7.3
Purpose	4	5	2	3.6
Behalf	3	3.4	0	0
Accompaniment	1	1.1	1	1.8
Matter	0	0	0	0
Role	1	1.1	2	3.6
Concession	5	5.7	1	1.8
Reporter	1	1.1	0	0
Frequency	5	5.7	3	5.4
Condition	8	9.2	2	3.6
Result	6	6.9	0	0

Summary	BP2	BL2
Total number of processes:	111	73
participants	198	117
circumstances	87	55

Texts: BP3/BL3

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mat	22	44	34	39.5	Actor	17	20	27	18.1
					Range	14	16.5	25	16.8
					Goal	3	3.5	2	1.3
					Beneficiary	1	1.2	1	0.7
					Attribute	0	0	1	0.7

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
relat	21	42	33	38.4	Token	10	11.8	12	8
					Value	12	14.1	11	7.4
					Carrier	8	9.4	14	9.4
					Attribute	8	9.4	15	10.1
					Possessor	1	1.2	5	3.3
					Possessed	1	1.2	5	3.3

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
verbal	1	2	9	10.5	Sayer	1	1.2	9	6
					Verbiage	1	1.2	9	6
					Receiver	0	0	0	0
					Target	0	0	0	0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mental	4	8	5	5.8	Senser	2	2.3	2	1.3
					Phenomenon	3	3.5	5	3.3
					Attribute	1	1.2	0	0
					Value	0	0	1	0.7

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
exist	2	4	5	5.8	Existent	2	2.3	5	3.3

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
behav	0	0	0	0	Behaver	0	0	0	0

Texts: BP3/BL3

Circumstances	P		L	
	Total	%age	Total	%age
Extent: Spatial	0	0	1	1
Temporal	1	2.4	0	0
Location: Place	6	14.3	15	14.6
Time	13	30.9	21	20.4
Manner: Means	2	4.8	7	6.8
Quality	0	0	5	4.8
Comparison	1	2.4	11	10.7
Cause: Reason	1	2.4	5	4.8
Purpose	2	4.8	1	1
Behalf	0	0	0	0
Accompaniment	4	9.5	2	1.9
Matter	1	2.4	0	0
Role	1	2.4	2	1.9
Concession	1	2.4	2	1.9
Reporter	1	2.4	15	14.6
Frequency	1	2.4	7	6.8
Condition	1	2.4	5	4.8
Result	5	11.9	4	3.9

Summary		BP3	BL3
Total number of	processes	50	86
	participants	85	149
	circumstances	42	103

Texts: CP1/CL1

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mat	51	50.5	31	35.6	Actor	38	21.1	23	13.9
					Range	33	18.3	23	13.9
					Goal	10	5.5	6	3.6
					Beneficiary	1	0.5	2	1.2
					Attribute	0	0	1	0.6
					Value	1	0.5	0	0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
relat	31	30.7	35	40.2	Token	17	9.4	25	15.1
					Value	18	10.9	22	13.3
					Carrier	9	5.4	10	6.1
					Attribute	9	5.4	10	6.1
					Possessor	5	2.8	3	1.8
					Possessed	6	3.3	3	1.8

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
verbal	11	10.9	12	13.8	Sayer	10	5.5	8	4.8
					Verbiage	11	6.1	12	7.3
					Receiver	0	0	0	0
					Target	1	0.5	1	0.6

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mental	8	7.9	8	9.2	Senser	5	2.8	6	3.6
					Phenomenon	8	4.4	8	4.8
					Attribute	0	0	1	0.6

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
exist	0	0	1	1.1	Existent	0	0	1	0.6

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
behav	0	0	0	0	Behaver	0	0	0	0

Texts: CP1/CL1

Circumstances	P Total	P %age	L Total	L %age
Extent: Spatial	0	0	2	3.8
Temporal	0	0	0	0
Location: Place	20	29.4	10	18.9
Time	6	8.8	6	11.3
Manner: Means	7	10.3	4	7.5
Quality	8	11.8	8	15.1
Comparison	2	2.9	1	1.9
Cause: Reason	1	1.5	3	5.7
Purpose	3	4.4	2	3.8
Behalf	0	0	0	0
Accompaniment	4	5.9	0	0
Matter	1	1.5	1	1.9
Role	3	4.4	1	1.9
Concession	1	1.5	0	0
Reporter	2	2.9	4	7.5
Frequency	1	1.5	3	5.7
Condition	7	10.3	7	13.2
Result	2	2.9	1	1.9

<u>Summary</u>

Total number of	CP1	CP2
processes:	87	101
participants	165	180
circumstances	53	68

Texts: CP2/CL2

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mat	28	37.8	41	49.4	Actor	24	18.9	16	12.7
					Range	15	11.8	27	21.4
					Goal	4	3.1	5	4.0
					Beneficiary	0	0	0	0
					Attribute	0	0	3	2.4

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
relat	30	40.5	29	34.9	Token	19	15	14	11.1
					Value	19	15	14	11.1
					Carrier	6	4.7	9	7.1
					Attribute	6	4.7	10	7.9
					Possessor	5	3.9	5	4
					Possessed	5	3.9	5	4

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
verbal	1	1.3	3	3.6	Sayer	0	0	1	0.8
					Verbiage	1	0.8	3	2.4
					Receiver	0	0	0	0
					Target	0	0	0	0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mental	11	14.9	10	12	Senser	3	6.3	5	4
					Phenomenon	11	8.7	9	7.1

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
exist	4	5.4	0	0	Existent	4	3.1	0	0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
behav	0	0	0	0	Behaver	0	0	0	0

Texts CP2/CL2

Circumstances	P Total	P %age	L Total	L %age
Extent: Spatial	0	0	0	0
Temporal	1	1.6	0	0
Location: Place	12	19	23	28.7
Time	12	19	7	8.7
Manner: Means	0	0	12	15
Quality	5	7.9	5	6.2
Comparison	5	7.9	5	6.2
Cause: Reason	4	3.1	4	5
Purpose	3	2.4	8	10
Behalf	1	1.6	0	0
Accompaniment	3	2.4	6	7.5
Matter	1	1.6	0	0
Role	0	0	2	2.5
Concession	3	2.4	3	3.7
Reporter	0	0	0	0
Frequency	3	2.4	2	2.5
Condition	5	7.9	1	1.2
Result	5	7.9	2	2.5

Summary	CP2	CL2
Total number of processes:	74	83
participants:	127	126
circumstances	63	80

Texts: CP3/CL3

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mat	29	47.5	31	45.6	Actor	22	21.1	17	14.6
					Range	20	19.2	19	16.4
					Goal	5	4.8	9	7.8
					Beneficiary	0	0	2	1.7
					Attribute	1	1	0	0
					Value	0	0	1	0.9

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
relat	28	45.9	28	41.2	Token	12	11.5	19	16.4
					Value	10	9.6	19	16.4
					Carrier	8	7.7	7	6.0
					Attribute	8	7.7	7	6.0
					Possessor	7	6.7	1	0.9
					Possessed	7	6.7	2	1.7

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
verbal	0	0	6	8.8	Sayer	0	0	4	3.4
					Verbiage	0	0	5	4.3
					Receiver	0	0	1	0.9
					Target	0	0	0	0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mental	1	1.6	0	0	Senser	0	0	0	0
					Phenomenon	1	1	0	0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
exist	3	4.9	3	4.4	Existent	3	2.9	3	2.6

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
behav	0	0	0	0	Behaver	0	0	0	0

Texts: CP3/CL3

Circumstances		P Total	P %age	L Total	L %age
Extent:	Spatial	0	0	0	0
	Temporal	2	3.4	1	1.4
Location:	Place	12	20.7	23	32.9
	Time	10	18.5	7	10
Manner:	Means	4	6.9	13	18.6
	Quality	5	8.6	5	7.1
	Comparison	5	8.6	2	2.9
Cause:	Reason	3	5.2	4	5.7
	Purpose	4	6.9	6	8.6
	Behalf	0	0	1	1.4
Accompaniment		2	3.4	0	0
Matter		1	1.7	1	1.4
Role		2	3.4	0	0
Concession		0	0	0	0
Reporter		0	0	2	2.9
Frequency		1	1.7	1	1.4
Condition		6	11.1	3	4.3
Result		1	1.7	1	1.4

Summary		CP3	CL3
Total number of	processes:	61	68
	participants	104	116
	circumstances	58	70

Texts: HP1/HL1

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mat	42	49.4	66	62.8	Actor	37	24.2	53	30.1
					Range	20	13.1	39	22.1
					Goal	7	4.6	11	6.2
					Beneficiary	3	2	0	0
					Attribute	3	2	6	3.4

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
relat	29	34.1	27	25.7	Token	19	12.4	10	5.7
					Value	19	12.4	6	3.4
					Carrier	9	5.9	9	5.1
					Attribute	9	5.9	9	5.1
					Possessor	1	0.6	8	4.5
					Possessed	1	0.6	8	4.5

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
verbal	2	2.3	1	0.9	Sayer	2	1.3	1	0.7
					Verbiage	2	1.3	1	0.7
					Receiver	0	0	0	0
					Target	0	0	0	0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mental	11	12.9	7	6.7	Senser	9	5.9	3	1.7
					Phenomenon	11	7.2	7	4.0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
exist	11	7	7	6.7	Existent	1	0.6	4	2.3

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
behav	0	0	0	0	Behaver	0	0	0	0

Texts: HP1/HL1

Circumstances	P Total	P %age	L Total	L %age
Extent: Spatial	1	1	3	2
Temporal	1	1	4	2.7
Location: Place	31	31	48	32.2
Time	18	18	46	30.9
Manner: Means	6	6	2	1.3
Quality	6	6	7	4.7
Comparison	7	7	8	5.4
Cause: Reason	4	4	4	2.7
Purpose	3	3	1	0.7
Behalf	3	3	4	2.7
Accompaniment	5	5	6	4
Matter	4	4	3	2
Role	3	3	0	0
Concession	2	2	5	3.4
Reporter	0	0	0	0
Frequency	5	5	5	3.4
Condition	1	1	0	0
Result	0	0	3	2

Summary		HP1	HL1
Total number of	processes:	85	105
	participants:	153	176
	circumstances:	100	149

Texts: HP2/HL2

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mat	41	57.7	51	45.5	Actor	32	24.6	37	18.5
					Range	20	15.4	27	13.5
					Goal	9	6.9	14	7
					Beneficiary	3	2.3	9	4.5
					Attribute	9	6.9	3	1.5

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
relat	11	15.5	25	22.3	Token	3	2.3	14	7
					Value	3	2.3	10	5
					Carrier	7	5.4	7	3.5
					Attribute	7	5.4	7	3.5
					Possessor	1	0.8	4	2
					Possessed	1	0.8	4	2

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
verbal	3	4.2	17	15.2	Sayer	2	1.5	9	4.5
					Verbiage	3	2.3	15	7.5
					Receiver	0	0	1	0.5
					Target	1	0.8	4	2

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mental	15	21.1	18	16.1	Senser	12	9.2	14	7
					Phenomenon	15	11.5	18	9
					Attribute	1	0.8	2	1

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
exist	1	1.4	1	0.9	Existent	1	0.8	1	0.5

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
behav	0	0	0	0	Behaver	0	0	0	0

Texts: HP2/HL2

Circumstances	P Total	P %age	L Total	L %age
Extent: Spatial	3	3.8	1	0.8
Temporal	2	2.5	1	0.8
Location: Place	20	25.3	23	19.5
Time	18	22.8	38	32.2
Manner: Means	5	6.3	1	0.8
Quality	7	8.9	7	5.9
Comparison	3	3.8	7	5.9
Cause: Reason	1	1.3	4	3.4
Purpose	6	7.6	5	4.2
Behalf	2	2.5	3	2.5
Accompaniment	0	0	9	7.6
Matter	0	0	0	0
Role	2	2.5	5	4.2
Concession	2	2.5	4	3.4
Reporter	0	0	0	0
Frequency	3	3.8	0	0
Condition	0	0	4	3.4
Result	5	6.3	6	5.1

Summary	HP2	HL2
Total number of processes:	71	112
participants	130	200
circumstances	79	118

Texts: HP3/HL3

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mat	47	48.9	87	54	Actor	33	21.1	63	23.2
					Range	23	14.7	55	20.3
					Goal	3	1.9	17	6.3
					Beneficiary	2	1.3	3	1.1
					Attribute	2	1.3	1	0.4
					Value	0	0	1	0.4

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
relat	29	30.2	45	27.9	Token	25	16	28	10.3
					Value	24	15.4	26	9.6
					Carrier	4	2.6	12	4.4
					Attribute	4	2.6	13	4.8
					Possessor	1	0.6	3	1.1
					Possessed	1	0.6	1	1.1

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
verbal	13	13.5	16	9.9	Sayer	10	6.4	12	4.4
					Verbiage	13	8.3	16	5.9
					Receiver	0	0	0	0
					Target	0	0	0	0

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
mental	5	5.2	8	5	Senser	3	1.9	4	1.8
					Phenomenon	5	3.2	8	2.9

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
exist	2	2.1	5	3.1	Existent	2	1.3	6	2.2

Process	P Total	P %age	L Total	L %age	Participants	P Total	P %age	L Total	L %age
behav	0	0	0	0	Behaver	0	0	0	0

Texts: HP3/HL3

Circumstances	P		L	
	Total	%age	Total	%age
Extent: Spatial	0	0	0	0
Temporal	0	0	3	1.5
Location: Place	20	22.7	34	17
Time	24	27.3	27	13.5
Manner: Means	0	0	6	3
Quality	10	11.4	21	10.5
Comparison	6	6.8	8	4
Cause: Reason	8	9.1	6	3
Purpose	1	1.1	3	1.5
Behalf	2	2.3	2	1
Accompaniment	2	2.3	6	3
Matter	3	3.4	5	2.5
Role	1	1.1	4	2
Concession	3	3.4	10	5
Reporter	1	1.1	50	25
Frequency	1	1.1	6	3
Condition	3	3.5	5	2.5
Result	3	3.4	4	2

Summary	HP3	HL3
Total number of processes:	96	161
participants:	156	271
circumstances:	88	200

Appendix E

Tables Showing Processes, Participants and Circumstances in Selected Matched Extracts

Appendix E: Table 1

Material Processes and Participants in Selected Extracts

A: BP1:5/BL1:5
BP1:5

1. Cod, flatfish, dragonets and crabs eat ophiuroids...
2. starfish appeared...
3. I tied Ophiothrix...and set them out...
4. I did the same experiment...
5. we find them...
6. Nothing much happened...
7. Starfish consumed bits of a few tethered brittlestars...
8. most of them survived.
9. ballan wrasses and flatfish ate most of the experimental animals
10. I repeated the experiment...
11. Ophiocomina nigra forms a dense bed...
12. the animals cover the bottom and hold up their arms...
13. The results of the predation experiment mirrored those of the British study.
14. The brittlestars live...
15. Wrasses and other reef fish ate virtually all tethered brittlestars...
16. they all survived...
17. brittlestars must spend their lives...

BL1:5

1. This lake supports a persistent, high density population of the epifaunal, suspension-feeding ophiuroid, Ophiuroid oerstedi.
2. [The ophiuroid density] occurs...
3. the brittlestars were completely consumed...
4. No significant ophiuroid mortality occurred...
5. Aronson and Harms (1985) demonstrated...
6. Sweetings Pond brittlestars expose themselves...

B: BP2:4/BL2:4
BP2:4

1. they find that each geographically distinct population stems from many lineages...
2. they calibrate their "genetic clock"
3. The Berkeley researchers then extrapolate...

BL2:4

1. This inference comes...
2. we minimize the number of intercontinental migrations...
3. The second implication...can be illustrated...
4. Six other lineages lead...
5. This small region of New Guinea...seems to have been

colonised...
6. we calculate the minimum numbers of female lineages...
7. Each estimate is based...
8. These numbers will probably rise...
9. A time scale can be affixed...
10. People colonised these regions...
11. These times enable us...
12. a detailed account of this calculation appears...
13. the common ancestral mtDNA (type a) links mtDNA types...
14. ancestral types b-j may have existed...
15. When did the migrations from Africa take place?
16. The oldest of the clusters...stems...
17. Its founders may have left Africa...

C: BP3:4/BL3:4

BP3:4

1. a new type of cat may have evolved...
2. Nigel Easterbee is trying to sort out this problem...
3. He is also working...
4. The work has only just begun...

BL3:4

1. Numbers of "wildcats" have increased...
2. A revision of the analyses reported here...could show whether a drift back had continued...

D: CP1:3/CL1:3

CP1:3

1. A useful analogy captures some of the flavour of this processing...
2. we find only the local interactions of buying and selling..
3. Local constraints govern each single such interaction...
4. the system as a whole settles...
5. Such networks can perform complex tasks...
6. each neuron is primed...
7. These neurons are also linked...
8. Neurons with compatible contents form inhibitory links...
9. we build up a global pattern of activation...
10. The computational work is done...
11. Parallel networks or "connection machines" yield a number of important benefits...
12. the excitatory and inhibitory connections between units complete the pattern...
13. The network can complete the pattern...
14. Such a network can also continue to function...
15. animals need to make quick decisions...
16. the network would store information
17. These units are linked...

CL1:3

1. These positively or negatively weighted connections encode (or come to encode) the data...
2. The unit fires...
3. Two units...may then be linked...
4. it will tend to inhibit the other...
5. Mutually supporting hypotheses may be linked...
6. The links...allow the individual units to excite...
7. those units...will be influenced by all the units...
8. An iterative process...ensues...
9. Each unit...is primed...
10. the global network should relax...
11. the system should often get it right.
12. Cooperative algorithms work...
13. global patterns of supply and demand are established by local interactions of buying and selling.
14. Overall knowledge of demand is thus distributed...
15. they exhibit behaviour...
16. no special mechanism is required...
17. the hypotheses are not explicitly stored.

E: CP2:5/CL2:5

CP2:5

1. The computer...needs to adopt numerical methods...
2. The method starts...and then measures the errors...
3. Newton's method calculates simultaneous adjustments...
4. it projects its model of the object...
5. it adjusts its estimate...
6. The process ceases...
7. [the computer] removes all of the edges...
8. the search area decreases...
9. the search ends...
10. many uninterpreted edges remain...

CL2: 5

1. The SCERPO vision system begins...
2. Figure 4 shows an image of a bin of disposable razors...
3. a grouping process is executed...
4. the reader is referred...
5. The groupings are matched...
6. the groupings are used...
7. The viewpoint consistency constraint can greatly improve reliability...
8. Figure 6 shows this sequence of operations...
9. Figure 6a shows an initial grouping...
10. The remainder of Figure 6 follows one of these tentative matches...
11. The initial viewpoint estimate...is made...
12. This is then refined...
13. the identified segments are marked...
14. the search space actually decreases...

15. The final results of this process are shown...
16. more than 15 segments were matched...
17. all the remaining matches provide confirmation...
18. Figure 9 shows...
19. Each edge in this image is drawn solid...
20. it could probably be speeded up...

F: CP3:2/CL3:2
CP3:2

1. We can divide parallel processors...
2. all the processors simultaneously carry out the same task..
3. it would store the coordinates for each object...
4. Each processor would then square, sum and take a root...
5. a parallel-data computer could produce as many results...
6. some processors would run programs...

CL3:2

1. SIMD (Single Instruction Multiple Data) computers execute the same instruction...
2. each processor runs its own program...
3. the processors must be able to communicate...
4. Data in the memory of one processor that is required by another must be passed...

G: HP1:3/HL1:3
HP1:3

1. Class conflict at the seaside revolve...
2. Most resorts began...
3. they developed trading and residential interests...
4. the established visiting public and its resident allies and dependants took fright.
5. They sought to curb the influx of excursion trains...
6. ...and to restrict the public behaviour of trippers...
7. They also tried to cut through what was often a tangle of conflicting jurisdictions...
8. assertive trippers...were met...
9. large landowners...were able to defend the status quo...
10. large sections of a resort could go...
11. it exposed the limitations of the ideal...
12. a more tolerant middle class reached out...
13. All classes mingled...

HL1:3
1. The earliest railway excursions to the coast both responded to and stimulated this wide range of demand.
2. Many patronized the Sunday School and temperance outings...
3. Ramsgate, for instance, found that not all of the "reputed advocates of total abstinences from intoxicating liquors".. were as staid and decorous as might have been expected.
4. the railways gave facilities...or ran cheap trips...
5. these open excursions attracted those...

6. the working class seaside holiday...catered for all shades of opinion...
7. they posed problems...and offered opportunities...
8. The existing "better-class" visiting public often reacted..
9. the new visitors came to constitute a market...
10. the commercialisation of entertainment...made its appearance...
11. stalls and fairground attractions were supplemented...
12. the commercial excursions and the railways' own regular cheap holiday fares dominated the market...
13. the popular resorts were able to grow...
14. some of the more thrifty and resourceful of the better-paid working-class visitors contrived to extend their stay...
15. This may well have been happening...
16. a working-class accommodation industry was clearly emerging
17. the new pattern of demand began to generate employment...
18. The lifestyles of the new visitors often generated conflict
19. the working-class season...provided a new impetus...
20. Blackpool provides the most obvious example...
21. the most rapid large-scale resort growth of the late nineteenth century came...
22. resorts like Southport...found difficulty...
23. the picture is complicated by the meteoric rise of Bournemouth...
24. Margate and Ramsgate found that the early appearance of working class visitors was no guarantee...
25. Even Southend's remarkable surge of development at the turn of the century was fuelled...by London commuters...
26. "better class" resort growth was beginning to change its focus...
27. the survival of irregular working habits, often associated with a deep attachment to a large number of customary festivals, inhibited the thrift and planning...
28. most industrial workers retained a preference for the safe local pleasures of neighbourly conviviality...
29. Conflicts flared in many resorts...

H: HP2:4/HL2:4

HP2:4

1. the covenanters sent forces...
2. Aberdeen changed hands...
3. the covenanters finally gained control of the region...
4. a force was stationed...
5. harsh reality failed to live up to his expectations...
6. Open opposition to the war, and to his policies in general, was spreading...
7. They could not keep the large army...
8. they would force a showdown...

HL2:4

1. The king's failure to invade Scotland forced him...
2. Each agreed to the treaty...
3. Ireland continued to play a major part in Charles' plans...

4. Donald Gorm...was apparently supplied with a ship and arms
5. Charles appointed Donald Gorm and Antrim...
6. Antrim was promised Kintyre...
7. the commission made no mention of Ireland...
8. the treaty of Berwick was used...
9. Argyll was assigned responsibility...
10. Dumbarton Castle had been handed back to the king...
11. Strafford's idea of landing troops there had been revived..
12. Strafford's [plan] was ruined by delays...
13. it probably still required training...
14. the covenanters commissioned Argyll...
15. Argyll would lead forces...
16. the covenanters did not send an army...

I: HP3:6/HL3:6

HP3:6

1. London and the big provincial cities and towns accounted for over 40 per cent of crime...
2. Urbanisation, however, has increased little...and can hardly account for the post-war rise in crime.
3. a substantial and growing amount of crime has occurred...
4. a sizeable proportion of children and young persons have always been found...
5. the high levels of unemployment in the 1930's...has been associated with the upward curve of criminality...

HL3:6

1. The relationship between crime and other variables...has also received some attention.
2. The connexion between property offences and prices (or trade cycle) has been more fully examined.
3. Samaha (1974) and Cockburn (1977b) find that variations in the incidence of theft closely follow the fluctuations in the price of food...
4. The major peaks in indictments follow the conclusion of wars...
5. Rising prices probably heightened the level of want...
6. the crime rate was affected...by unemployment...
7. the recorded levels of property crime fluctuated...
8. more took to this form of self-help.
9. this relationship began to reverse itself.
10. Property crime...were increasingly associated with periods of prosperity...

Appendix E: Table 2

Relational Processes and Participants in Selected Extracts

A: BP1:5/BL1:5

BP1:5

1. They might have been the chief predators...
2. The relults were identical...
3. The predation argument would be even more convincing
4. This is another species of Ophiothrix...
5. Sweetings Pond is cut off from the Caribbean Sea...
6. and Ophiothrix oerstedii are 100 times more abundant...

7* It is...more than coincidental that there are no reef fish that eat brittlestars in this lake.

8. the main predators have impeccable Palaeozoic pedigrees...
9. Ophiothrix is rare.
10. predation is...an important clue to the abundance of brittlestars.

BL1: 5

1. Sweetings Pond...contains another type of anachronistic community.
2. The ophiuroid density...is two orders of magnitude higher..
3. This behavioural difference is causally related to the difference in predatory activity by fishes...

B: BP2:4/BL2:4

BP2:4

1. This [estimate] fits with data from other species.

BL2:4

1. It follows that b is a likely common ancestor of all non-African and many African mtDNAs...
2. Asian lineage 50 is closer genealogically to this New Guinea lineage...

3* One way of estimating this rate is to consider the extent of differentiation within clusters specific to New Guinea..

4. This rate is similar to previous estimates from animals as disparate as apes, monkeys, rhinoceroses, mice, rats, birds and fishes.
5. [The oldest of the clusters of mtDNA types to contain no African members] included types 11-29...
6. The apparent age of this cluster...is 90 000 to 180 000 years...

7* it is equally possible that the exodus occurred as recently as 23-105 thousand years ago...

C: BP3:4/BL3:4
BP3:4

1. The Scottish wild cat does seem to be threatened by hybridisation...
2. A sample of skulls from the 1970s were much more similar in shape to the pure-bred wild cats of the last century.
3* It is possible that...hybridisation with domestic cats is reduced.
4* The trouble with skull measurements is that we can not really be sure what is happening.
5* It should be possible to find out how much interbreeding is going on...
6* It is critical that we find out exactly what is happening to the Scottish wild cat...

BL3:4

1. [What future changes] are likely?
2. the two events are correlated.

D: CP1:3/CL1: 3
CP1:3

1. Neural networks...are vast parallel networks of richly interconnected but relatively slow and simple processors...
2. The relative slowness of the individual processors (neurons) is offset...
3. Vision and sensori-motor control are prime examples of the usefulness of organising networks in parallel cooperation.
4* The first of these [benefits] is "graceful degradation".
5. This is the capacity to function plausibly well despite the absence of...adequate data.
6. this would correspond to the overall market's capacity to tolerate the loss of a few local trading interactions without affecting the overall picture of supply and demand.
7. Graceful degradation...makes for biological star quality.
8. The second benefit I wish to mention is somewhat more elusive.
9. It [information holism] involves the integration of much of the stored information that we intuitively tend to see as separate, discrete lumps.

CL1:3

1. Parallel Distributed Processing is a generic term covering a class of models exhibiting a variety of algorithmic forms
2. The type of architecture involves a large number of simple processing units connected in parallel...
3. The state of a unit at a given time will depend...on the state of all the units to which it is linked.
4. This [relaxation] will amount to an interpretation of the

intensity array...
5* The essential point to note...is that connectionist machines...are not just vast parallel processors.
6. Parallelism alone is not enough.
7* what counts is a process of cooperative group decision.
8. Cooperation is...local
9* A homely example...is that of the open market place.
10. The way of encoding and retrieving specific information results in a functional correlate of prototype-based reasoning.
11. This is...a rather general property of PDP-style approaches
12* It perhaps misleading to say that network does not in some sense learn to deploy the rules.
13. it becomes structured
14. this...seems...to amount to a version of such storage
15* What is interesting...is that such rules depend on no special mechanism of rule generation...
16* It is in this sense that distributed models...provide alternatives to a variety of models...

E: CP2:5/CL2:5

CP2:5

1* The first step in recognition is to find a promising correspondence between a few features...
2* it is mathematically difficult to define an object's position...
3. The equations are nonlinear...
4. they have no straightforward solution.
5* The mathematical technique we adopted at New York Univrsity is Newton's method which Sir Isaac Newton developed in the 17th century.
6* it is unlikely that more than a few matches will be consistent with the initial estimate of the viewpoint.
7. the number of remaining edges in the image become fewer...

CL2:5

1. The viewpoint consistency constraint is of little use for the initial stages of matching.
2. human vision does have such "perceptual organization" capabilities for detecting bottom-up viewpoint-independent structure in the image.
3. The methods for perceptual organization are beyond the scope of this paper...
4. Matches between an object and the image that based simply upon viewpoint-invariant properties will...be unreliable.
5. we can have very reliable identification...
6. The total computation time expended on this example was about 3 min...
7. All of the code beyond the edge detection stage is written in Franz LISP...

F: CP3:2/CL3:2

CP3:2

1. each processor has its own programs to carry out...
2. This may be quite different from the programs that its neighbours are running.

CL3:2

1. SIMD machines...have direct serial connections...
2. The bus must be fast enough to service all the processors and memories...
3. [the bus] must contain arbitration logic...
4. The BBN Butterfly Computer is such a machine.
5* A simpler model of parallel processing is that each processor should have its own memory...
6. The Intel Hypercube, Ncube and Meiko Computing Surface are examples of this type of machine.

G: HP1:3/HL1:3

HP1:3

1. [Class conflict] was about styles of spending money...
2. This kind of conflict was common to almost all resorts near major population centres.
3. The classes continued to be segregated geographically...
4. The social harmony of the Edwardian seaside...owed more to class segregation than to social reconciliation.

HL1:3

1. These developments were particularly pronounced...
2. Sunday Schools, temperance societies and paternalistic employers were quick to use the seaside excursion as a counter-attraction to the fairgrounds and race-meetings...
3. the enjoyment of cheap travel and the cult of sea bathing also had devotees among the unregenerate.
4. Such developments depended on the regular appearance of large numbers of working-class visitors...
5. The working-class day-tripper never had much to offer the economy of most resorts...
6. This was true...
7. it was the resorts which adapted best to this new stimulus which expanded fastest.
8. Day-trips were increasingly well-patronized...
9. only the skilled and supervisory groups among the working class had the will or the resources to take a full-scale holiday away from home.
10. Such working people were usually "respectable" in dress and demeanour...
11* it was not until the twentieth century...that most working-

class day-trippers became metamorphosed into staying visitors.

H: HP2:4/HL2:4

HP2:4

1. time proved to be on their side, not on his.
2. the king had grandiose schemes...

HL2:4

1. Donald Gorm of Sleat was to have Ardnamurchan...
2* It was a change in the king's plans that made these defensive measures necessary...
3* It is likely that the covenanters had already resolved to force the king to fight by invading England...
4* The other main danger they foresaw...was that Strafford would lead a diversionary raid from Ireland...
5. those who thought the commission 'may be but a boast to hold the Irish army at home' were wrong.
6. their plans...were no idle boasting...

I: HP3:6/HL3:6

HP3:6

1. [what about] larger social and economic forces?
2. rates of crime per head were much higher in urban areas than in rural regions
3. The numbers 'feeling' poor is what counts.
4. [what] of the criminogenic impact of unemployment?

HL3:6

1. We are still in need of a study of the association between crime and the rate of urbanisation in the nineteenth century...
2. The situation in urban Surrey (London) was more complex.
3. Offenders seem not to have been under any immediate pressure of hunger...
4. poaching seems often to have been born of poverty...

Appendix E: Table 3

Circumstances of Time and Place in the Introductory and Concluding Sections of Selected Learned and Popular Texts

1a: BP1 Place
in rough seas
in a small inflatable boat
up
over the side
30 metres down
into view
over an immense carpet of brittlestars...
Here
From Chadwick's century-old record and studies by a student in the 1960's
only where predation is low

1b: BP1 Time
in 1885
Reporting on the exhibition
A century later
In the following weeks
Today

1c BL1 Place
In this chapter

1d BL1 Time
During the last few years
now

2a BP2 Place
in their chemical composition
to the order of bases in DNA
down through the male line
where this [a limited degree of chromosome recombination] does not happen often
in the figure
in an individual

2b BP2 Time
in the first week of 1987, following an article in Nature...
More recently
yet
much more recently than Eve
a few millenia before him

2c BL2 Place
into our genetic divergence from apes, and into the way in which humans are related to one another genetically
in nuclear genes
from both parents
in every generation
within a typical human

2c BL2 Time
now

3a BP3 Place
not from man but from the feral domestic cat
in Cyprus and the Near East
in the tombs of Ancient Egypt

3b BP3 Time
today
This time
by about 6000 BC
As the Scottish wild cat was ruthlessly eradicated from Britain
Once the wild cat began to recover from man's persecution
Recently

3c: BL3 Place
throughout the British Isles, except Ireland and the "Outer Islands" (Orkney, Hebrides etc)
from England, Wales and Southern Scotland
even in the Scottish Highlands
into Britain
throughout Scotland
from its nineteenth century "low"
In this paper

3d BL3 Time
formerly
at least as far back as the Pleistocene
By the end of the 19th Century
much later, in about the 11th Century
earlier
now
Over the past 60 years or so
in recent years

4a CP1 Place
on the relatively new discipline of Aritificial Intelligence
in cognitive science
on a new approach to designing computers, known as "connectionism"
to 49
in a series of operations on these external symbols
To an evolutionary theorist
To many cognitive scientists

4b CP1 Time
[None]

4c CL1: Place
In what follows
In the present paper

4d CL1: Time
[None]

5a CP2: Place
on engineering its working area
from providing robots with a sense of sight

5b CP2 Time
already

5c CL2 Place
at providing viewpoint invariant groupings of image features that can be judged unlikely to be accidental in origin, even in the absence of specific information regarding which objects may be present.
upon the full use of the viewpoint consistency constraint
right back to the image level
upon a probabilistic analysis of the likelihood that each potential match is correct
to a much smaller search space

5d CL2 Time
no longer

6a CP3 Place
in applications such as guiding aircraft and the control of processes in industry
around the world

6b CP3 Time
already
still

6c CL3 Place
In this paper
in Refs 1 and 2
in section 4
In section 5
on a variety of computer architectures
In practice
in some cases
in many of the models studied to date
in such cases

6d CL3 Time

Following early exploitation of the ICL Distributed Array Processor at Queen Mary College

More recently (March 1986)

7a HP1 Place

to the nineteenth century

into textbooks and general interpretations

here

on the textbook and the school examination syllabus

in his Town, City and Nation: England 1850-1914 (Oxford 1983)

to several kinds of town which have attracted extensive recent research...

at the seaside

in any assessment of urban development in Victorian and Edwardian England

at that point

in general analyses of urbanisation and social change during the key decades of transition to industrial society in Victorian and Edwardian England

7b HP1 Time

now

yet

by 1914

in the future

In the meantime

7c HL1 Place

among the fastest-growing English towns

at many resorts

beyond the excursion stage

on the coasts of Lancashire and North Wales

in amusements and accommodation for a working-class market

In all these areas

In these areas of northern England

7c HL1 Time

in a period of rapid urbanization

by the later nineteenth century

From the 1870s onwards

by the turn of the century

8a HP2 Place

from the Scottish point of view

to Edinburgh

In the state

to Ireland

into civil war between the king and the English parliament

8b HP2 Time

By 1637
In the spring of 1638
After long negotiations in London in 1640-1
Within a few years
in 1641
in 1642
in the same year
in 1643
within a decade

8c HL2 Place

between the inhabitants of Ireland and Scotland
there
to Scotland from Ireland
in Ireland
In this
in his struggle with the covenanters
to Scotland
(at Ripon...)
from an asset into a liability
In Ireland
in an attack on Strafford and his policies
Outside parliament
in at least nine parishes in Antrim and Down
in Scotland and Ireland
In Scotland
In Ireland
in the hands of the Irish
not from the regime in Dublin but from the Catholic Irish

8d HL2 Time

At the beginning of the sixth century
later
once resistance to the king in Scotland began
In September 1637
in 1638
in mid-1638
soon
As soon as a cessation was signed between the king and the covenanters
(...on 17 October)
in 1640-1
In March and April 1641, during the trial of Strafford...
while 'the Scottismens frequent brags in the North, that Leslie wold come over ere long, and make a general reformation'
in May 1641
the same month
in 1641
In July
early in 1641
By May
in August

on 22 October 1641
within a few days
now

9a HP3 Place

In theft and breaking-in offences
on groups amongst whom crime has remained comparatively rare...

9b HP3 Time

In the first half of the century
From 1900 to 1914
between 1915 and 1930
between 1930 and 1948

9c HL3 Place

in this new field
in separate essays
In one case
in the same monograph
in this work
only on the basis of this latter evidence, albeit imperfect
in such basic methods as the construction of crime rates and the validation of statistical findings

9d HL3 Time

until recently
In the last decade
in the past
At times
since the days of historical research into crime
still
now
yet
in the last decade

Appendix F

Subjects and Finites in Extracts from the Corpus

Key

R: Remote finite
I: Immediate finite

Group: BP1
Extract: BP1:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	the Liverpool Marine Biology Committee	R	Positive	surveyed
2.	Herbert Chadwick	R	Positive	noted
3.	I	R	Positive	rounded
4.	It	R	Positive	had taken
5.	I	R	Positive	gazed
6.	I	R	Positive	rolled
7.	We	R	Positive	floated
8.	the seabed	R	Positive	came
9.	A swift current	R	Positive	carried
10.	The sight	R	Positive	was
11.	we	I	Positive	encounter
12.	there	R	Positive	were
13.	it	R	Positive	was
14.	Mike Bates, a diving technician at Port Erin	R	Positive	helped
15.	We	R	Positive	found

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
16.	the numbers	I	Positive	are
17.	The southwestern tip of the Isle of Man	I	Positive	is
18.	we	I	Positive	know
19.	Evidence from fossils	I	Positive	suggests
20.	A closer look at today's brittlestar beds	R	Positive/Possible	might tell
21.	Brittlestar beds	I	Positive	are
22.	They	I	Positive	are
23.	the Cretaceous	R	Positive	was
24.	Epifaunal suspension feeders -- animals such as brittlestars, sea lillies (stalked crinoids) and lampshells (brachiopods) that lived on top of the sea floor and filtered organic particles from the water	R	Positive	formed
25.	they	R	Positive/Degree	virtually disappeared
26.	Today's brittlestar beds	I	Positive	are

Group: BL1
Extract: BL1:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	much attention	I	Positive	has been paid
2.	recent efforts to uncover causal connections between physical events of global or even galactic magnitude and periodic, catastrophic extinctions	I	Positive	have been
3.	The human mind	I	Positive/Possible	is perhaps
4.	The intellectual attraction to extinction	I	Positive/Degree	is amply reflected
5.	the dynamics of biotic interactions that caused global-scale community reorganisations	I	Positive	are
6.	it [that predator activity was of great importance to at least one biotic upheaval]	I	Positive	is
7.	we	I	Positive	hope
8.	Results from this living community	I	Positive	are...used
9.	Williamson (1982)	I	Positive/Degree	has virtually dismissed
10.	the fossil record	I	Positive	provides
11.	we	I	Positive	take

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
12.	it [that extant ophiuroid communities have persisted for long periods of time]	I	Positive	is
13.	The Sweetings Pond <u>Ophiothrix oerstedii</u> community	I	Positive	has been
14.	dense beds of <u>O. fragilis</u>	I	Positive	have been known
15.	The same	I	Positive/Possible	can be said
16.	these dense assemblages of ophiuroids	I	Negative	are not
17.	[Subject as 16: deleted]	I	Positive	represent
18.	Only one case	I	Positive	conforms
19.	Kesling (1969)	I	Positive	has postulated
20.	we	I	Positive	find
21.	Such anachronistic communities of organisms	I	Positive/Possible	can be
22.	These rare circumstances	I	Positive	are
23.	Stromatolites, which are structures composed of filamentous prokaryotes, trapped sediment and associated biota	I	Positive	are
24.	they	I	Positive	are thought
25.	This inference	I	Positive/Degree	is based in part

Group: BP1
Extract: BP1:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	dense populations of Ophiothrix and another species, Ophiothrix nigra	I	Positive	live
2.	Divers	I	Positive	encounter
3.	Brendan Keegan, a marine biologist at University College, Galway	I	Positive	has
4.	The Manx fishermen	I	Positive	avoid
5.	There [Existential]	I	Positive	are
6.	I	I	Positive/ Anticipatory	Strangely... know

Group: BL1
Extract: BL1:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Population densities in the autochthonous assemblages	I	Positive/Possible	can be
2.	Kesling and Le Vasseur (1971)	R	Positive	estimated
3.	Liddel (1975)	I	Positive	reports
4.	densities in some populations	I	Positive	are
5.	Warner (1971)	R	Positive	studied
6.	Vevers (1952)	R	Positive	counted
7.	Ophiocomina nigra	I	Positive	occurs
8.	Even higher ophiuroid densities	I	Positive	have been recorded
9.	The highest mean density of Ophiothrix oerstedii recorded in Sweetings Pond	R	Positive	was

Group BP1
Extract: BP1:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Ecological studies	I	Positive	tell
2.	We	I	Positive/Possible	can look
3.	we	I	Positive	gain
4.	we	I	Positive/Possible	can begin
5.	Crinoid gardens	I	Positive/Degree	have completely disappeared
6.	brittlestar beds	I	Positive	remain
7.	The vast swathes of ophiuroids	I	Positive	are

Group BL1
Extract: BL1:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	we	I	Positive	have shown
2.	Saltwater lakes and other islands	I	Positive	are
3.	The Bahama Islands	I	Positive	contain
4.	most of them	I	Positive	remain
5.	Great Oyster Pond	I	Positive	is
6.	This body of water	I	Positive	supports
7.	a small apodid holothurian	R	Positive	was found
8.	Release of benthic organisms due to the absence of predatory fishes	I	Positive	has been noted

Group BP1
Extract: BP1:4a

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	A second requirement for brittlestar beds	I	Positive	is
2.	the brittlestars	I	Negative/Possible	cannot feed

Group BL1
Extract: BL1:4a

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	the leading cause of death for ophiuroids	I	Positive	is
2.	Schafer	R	Positive	noted
3.	Fine-grained sedimentary matter	I	Positive/Presumption	presumably obstructs
4.	Areas of rapid sedimentation	I	Positive	are
5.	Kesling (1969), Rosenkranz (1971) and Goldring and Stephenson (1972)	I	Positive	have analyzed
6.	Articulated ophiuroids	I	Positive/Frequency	are usually found

Group: BP1
Extract: BP1:4b

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The flow of water and the amount of sedimentation in it	I	Positive	provide
2.	many rocky reefs	I	Positive	are swept
3.	[Subject as 2: deleted]	I	Positive	have
4.	The third key requirement for a dense blanket of ophiuroids	I	Positive	is

Group: BL1
Extract: BL1:4b

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Aronson and Harms (1985)	I	Positive	have suggested
2.	We	R	Positive	found
3.	Allman (1863)	R	Positive	described

Group BP1
Extract: BP1:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Cod, flatfish, wrasses, dragonets and crabs	I	Positive	eat
2.	These modern predators --modern, geologically speaking	I	Positive/Frequency	are rarely seen
3.	slow-moving starfish	I	Positive	are
4.	starfish	R	Positive	appeared
5.	They	R	Positive/Possible	might have been
6.	I	R	Positive	tied
7.	[Subject as 6: deleted]	R	Positive	set...out
8.	I	R	Positive	did
9.	brittlestars	I	Positive	are
10.	we	I	Positive	find
11.	Nothing much	R	Positive	happened
12.	Starfish	R	Positive	consumed
13.	most of them	R	Positive	survived
14.	ballan wrasses and flatfish	R	Positive	ate
15.	I	R	Positive	repeated
16.	Ophiocomina nigra	I	Positive	forms
17.	The results	R	Positive	were
18.	predation pressure	I	Positive	is
19.	The predation argument	R	Positive/Predictive	would be
20.	there [existential]	I	Positive	is

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
21.	This	I	Positive	is
22.	Sweetings Pond	I	Positive	is
23.	Ophiothrix oerstedii	I	Positive	are
24.	the animals	I	Positive	cover
25.	[Subject as in 24: deleted]	I	Positive	hold up
26.	It [that there are no reef fish that eat brittlestars in this lake]	I	Positive/Possible	is surely
27.	the main predators	I	Positive	have
28.	they	I	Positive	are
29.	Ophiothrix	I	Positive	is
30.	The brittlestars	I	Positive	live
31.	The results of predation experiments in the Caribbean	R	Positive	mirrored
32.	Wrasses and other reef fish	R	Positive	ate
33.	they	R	Positive	survived
34.	predation	I	Positive	is
35.	It	I	Positive	explains
36.	brittlestars	I	Positive/Necessary	must spend

Group: BL1
Extract: BL1:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Sweetings Pond, an isolated saltwater lake on Eleuthera Island	I	Positive	contains
2.	This lake	I	Positive	supports
3.	The ophiuroid density, which sometimes exceeds 400 individuals per square meter (figs. 23.1A and 23.2)	I	Positive	is
4.	[Subject as in 3: deleted]	I	Positive	occurs
5.	the brittlestars	R	Positive/Degree	were completely consumed
6.	No significant ophiuroid mortality	R	Positive	ocurred
7.	Gut content and fecal analyses of all possible Sweetings Pond predators of Ophiothrix, including the large majid crab Mithrax spinosissimus	R	Positive	confirmed
8.	Aronson and Harms (1985)	R	Positive	demonstrated
9.	Sweetings Pond brittlestars	I	Positive	expose
10.	This behavioral difference	I	Positive/Causal	is causally related

Group: BP1
Extract: BP1:6

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The top carnivores in Sweetings Pond	I	Positive	are
2.	They	I	Positive	eat
3.	Octopuses	I	Positive	are
4.	A cephalopod at the top of the food chain	I	Positive	makes

Group: BL1
Extract: BL1:6

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Cephalopods with external shells (ectocochliates)	R	Positive	were
2.	nautiloids and ammonoids	I	Positive/Admissive/ Possible	In fact... may have contributed
3.	Crop contents of Jurassic ammonites	R	Positive	contained
4.	the deep-dwelling Nautilus	I	Positive	is
5.	it	I	Positive	is
6.	The increased development of coarse ornamentation on ammonoid shells, especially by Cretaceous times	I	Positive	is interpreted
7.	The ammonoids	R	Positive	decreased
8.	Both global-scale physical disruptions (Alvarez et al. 1984) and the activities of durophagous predators (including invertebrates; Ward 1983)	I	Positive/Possible	may have contributed

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
9.	its high density of <u>Octopus briareus</u>, the Caribbean reef octopus	I	Positive	is
10.	The population density of this cephalopod	I	Positive	is
11.	the absence of predatory fishes	I	Positive/Possible	appears to be
12.	The octopuses	I	Positive	are limited
13.	It [that a slow-moving, epifaunal suspension-feeding echinoderm, which carpets portions of the lake substrate and gives the benthos a distinctly Paleozoic appearance, is accompanied by a cephalopod (which does not feed upon ophiuroids; Aronson and Harms 1985).]	I	Positive/Possible	is perhaps
14.	Ectocochliate cephalopid carnivores	R	Positive	were
15.	they	I	Positive/Possible	may have exerted
16.	the abundant octopuses in Sweetings Pond	I	Positive/Possible	may be
17.	The observations in Sweetings Pond	I	Positive	support
18.	exposed ophiuroids	I	Positive/Time	still occur
19.	fluctuations in the occurrence of dense beds of <u>Ophiothrix fragilis</u> in the English Channel over a period of several decades	I	Positive	have been correlated
20.	we	I	Positive/Predictive	shall review
21.	[Subject as in 20: deleted]	I	Positive/Predictive	[shall] attempt
22.	there [existential]	R	Positive	was
23.	there [existential]	I	Positive	is

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
24.	It [to imagine that cephalopods were common predators in some ancient ophiuroid-dominated communities, as they are in Sweetings Pond]	I	Negative	is not
25.	Ectocochliates and coleoids	I	Positive/Possible	are certainly
26.	we	I	Positive	suspect
27.	the only living cephalopod that preys on ophiuroids	I	Positive/Presumptive	To our knowledge...is
28.	dense populations of ophiuroids	R	Positive/Possible	could thrive

Group BP1
Extract: BP1:7

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	What	I	Positive	happens
2.	Many beds in the western English Channel	I	Positive	have disappeared
3.	Norman Holme of the Marine Biological Association in Plymouth	I	Positive	links
4.	these populations	R	Positive	had been doing
5.	Predators	R	Positive	tipped

Group: BL1
Extract: BL1:7

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	exposed ophiuroids	I	Positive/Time	still occur
2.	fluctuations in the occurrence of dense beds of Ophiothrix fragilis in the English Channel over a period of several decades	I	Positive	have been correlated

Group: BP1
Extract: BP1:8

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	I	R	Positive	compared
2.	Not one brittlestar in a Jurassic population from Dorset	R	Positive	was regenerating
3.	70 per cent of a closely-related living species from Belize	R	Positive	had
4.	This	I	Positive	is
5.	it	I	Positive/Possible	certainly supports
6.	Palaentologists	I	Positive	have looked at
7.	The highest level of injury they have found	I	Positive	is

Group: BL1
Extract: BL1:8

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Lehmann	R	Positive	studied
2.	Only 23 specimens	R	Positive	showed
3.	This	I	Positive	is
4.	there [existential]	I	Positive	are
5.	The shales	I	Positive	differ
6.	The formation of this unusually rich and and diversified assemblage of marine fossils	R	Positive/Possible	was possibly
7.	Kesling and Le Vasseur (1971)	R	Positive	found
8.	They	I	Positive	estimate
9.	that of the Late Jurassic Solnhofen lithographic limestones in Bavaria	I	Positive	is
10.	These deposits	R	Positive	formed
11.	The small ophiuroids <u>Geocoma carinata</u> and <u>Ophiurella speciosa</u>	I	Positive	are
12.	The associated fauna	I	Positive	contains
13.	We	I	Positive	know
14.	Of 55 well-preserved specimens of <u>Ophiomusium weymouthiense</u> from the Late Mid-Jurassic of Weymouth, Dorset, housed in the collections of the British Museum (Natural History), only one	R	Positive	showed

Group: BP1
Extract: BP1:9

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	it [that ancient brittlestar beds and crinoid gardens were severely affected when new, more efficient predators appeared in the Cretaceous]	I	Positive/	appears
2.	epifaunal brittlestar beds	I	Positive	survive
3.	The next step	I	Positive/Predictive	will be

Group: BL1
Extract: BL1:9

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	the temporal distribution of these communities and the data on predation in some extant assemblages	I	Positive	support
2.	we	I	Positive	see
3.	Dense extant assemblages on soft substrates in shallow-water settings	I	Positive/Frequency	are frequently composed
4.	Exposed epifaunal brittlestars	I	Positive	are
5.	they	I	Positive/Possible	can dominate
6.	The study of ecological release in saltwater release	I	Positive	has
7.	Information culled from Sweetings Pond and other lakes	I	Positive/Possible	may enable
8.	The high abundance of Octopus in a back-reef community on the north coast of Jamaica	I	Positive/Possible	may be related
9.	We	I	Positive	recommend

Group: BP2
Extract: BP2:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Adam	R	Positive	called
2.	Eve	R	Positive	hit
3.	the Daily Telegraph	R	Positive	said
4.	What	I	Positive	is
5.	Rebecca Cann, Mark Stoneking, and Allan Wilson, of the University of California at Berkeley	I	Positive	present
6.	[Subject as 5.; deleted]	I	Positive	estimate
7.	The common ancestor of all the lineages	I	Positive/Possible	may represent
8.	Studies of evolution	I	Positive	have become
9.	Investigations of protein structure	R	Positive	superseded
10.	two proteins that apparently carry out the same role in two different types of organism	I	Positive/Possible	may vary
11.	This kind of data	I	Positive	enables
12.	the immunological properties of albumen, a protein found in blood plasma	I	Positive	suggest
13.	comparisons based on the analysis of DNA	I	Positive	have provided
14.	Researchers studying protein structure	I	Positive	determine
15.	The genetic code	I	Positive	links
16.	this code	I	Positive	is

Group: BP2
Extract: BP2:1 (cont)

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
17.	A mutation in one base	R	Positive	might leave
18.	analysis of the DNA	I	Positive	gives
19.	the hypothesis	R	Positive/Obligation	should be qualified
20.	the statement "typical mammalian females ... behave as haploids"	I	Positive	is
21.	recent studies in cows	I	Positive	have shown
22.	an individual cow	I	Positive/Possible	may contain
23.	a new mitochondrial mutation	I	Positive	does...become
24.	[Imperative: subject deleted]	I	Positive	Suppose
25.	this mutated genome alone	R	Positive/Possible	could..populate
26.	that some kind of bottleneck exists	I	Positive	is
27.	the individual	R	Positive/Possible	might be
28.	it	I	Positive	is
29.	one or other mitochondrial population	I	Positive	takes over
30.	a mutation	I	Positive	is
31.	a rare paternal contribution or some kind of recombination event	[Minor clause: verbless]		
32.	Any of these	R	Positive/Hypoth	would complicate

Group: BL2
Extract: BL2:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Molecular biology	I	Positive	is
2.	It	I	Positive	has provided
3.	Our picture of genetic evolution within the human species	I	Positive	is
4.	Mutations	I	Positive	accumulate
5.	nuclear genes	I	Positive	are inherited
6.	[Subject as 5.; deleted]	I	Positive	mix
7.	This mixing	I	Positive	obscures
8.	[Subject as 7.; deleted]	I	Positive	allows
9.	Recombination	I	Positive	makes
10.	Our world-wide survey of mitochondrial DNA (mtDNA)	I	Positive	adds
11.	mtDNA	I	Positive	gives
12.	it	I	Positive	is
13.	there	I	Positive	are
14.	Typical mammalian females	I	Positive	behave
15.	This maternal and haploid inheritance	I	Positive	means
16.	A pair of breeding individuals	I	Positive/Possible	can transmit
17.	[Subject as 16.; deleted]	I	Positive/[Possible]	(can) carry
18.	The fast evolution and peculiar mode of inheritance of mtDNA	I	Positive	provide

Group: BP2
Extract: BP2:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	This approach	I	Positive	is based
2.	The longer the time since this occurred, the more the differences that accumulate.	[Minor clause: verbless]		
3.	Only a small proportion of the DNA in the nucleus of a cell	I	Positive	codes
4.	The non-coding regions	I	Positive	accumulate
5.	Selection	I	Positive	operates
6.	The presence, in a population, of two or more variants of a gene	I	Positive	is called
7.	evolutionary geneticists	I	Positive/Possible	can estimate
8.	Small differences between corresponding regions of DNA in two groups	R	Positive/Hypoth	would suggest
9.	large differences	R	Positive/Hypoth	would suggest
10.	Cann and her colleagues	I	Positive	study
11.	Mitochondria	I	Positive/Frequ	are often called
12.	They	I	Positive	are
13.	These	I	Positive	include
14.	each mitochondrion	I	Positive	contains
15.	Most of this DNA	I	Positive	codes
16.	this compact piece of DNA	I	Positive	encodes

Group: BP2
Extract: BP2:2 (cont)

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
17.	every piece of mitochondrial DNA	I	Positive	is
18.	Each individual	I	Positive	inherits
19.	the unfertilised ovum	I	Positive	contains
20.	Experiments	I	Positive	demonstrate
21.	no examples of recombination between maternal and paternal mitochondrial genomes	I	Positive	have been documented
22.	mitochondrial DNA	I	Positive	mutates
23.	All these factors	I	Positive	make
24.	Every individual	I	Positive	inherits
25.	the rate of acquiring mutations	I	Positive/Possible	can act

Group: BL2
Extract: BL2:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	A tree relating the 133 types of human mtDNA and the reference sequence (Fig.3)	R	Positive	was built
2.	we	I	Positive	make
3.	We	I	Positive/Possible	can...view

Group: BP2
Extract: BP2:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Cann and her colleagues	R	Positive	started
2.	They	R	Positive	digested
3.	Each restriction enzyme	I	Positive	recognises
4.	[Subject as 3.; omitted]	I	Positive	breaks
5.	The result	I	Positive	is
6.	These	I	Positive/Possible	can be sorted out
7.	the collection of fragments	I	Positive/Possible	will be
8.	the resulting pattern	I	Positive/Possible	will [be]
9.	Restriction mapping, as the technique is called	I	Positive	is
10.	Cann	R	Positive/Possible	could discern
11.	the researchers	R	Positive	plotted
12.	This tree	I	Positive	is constructed
13.	Closely-related DNAs	I	Positive	are joined
14.	widely divergent DNA types	[verb as 13.; omitted]		
15.	The tree	I	Positive	has
16.	Cann, Stoneking and Wilson	I	Positive	advance

Group: BL2
Extract: BL2:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Each purified mtDNA	R	Positive	was subjected
2.	Restriction sites	R	Positive	were mapped
3.	we	R	Positive	identified
4.	An average of 370 restriction sites per individual	R	Positive	were surveyed
5.	The 147 mtDNAs mapped	R	Positive	were divisable
6.	Seven of these types	R	Positive	were found
7.	no individual	R	Positive	contained
8.	None of the seven shared types	R	Positive	occurred
9.	One type	R	Positive	was found
10.	another type	R	Positive	occurred
11.	two more types	R	Positive	occurred
12.	two additional types	R	Positive	were found
13.	the seventh case	R	Positive	involved
14.	A histogram showing the number of restriction site differences between pairs of individuals	I	Positive	is given
15.	the average number of differences observed between any two humans	I	Positive	is
16.	The distribution	I	Positive	is

Group: BP2
Extract: BP2:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	they	I	Positive	suggest
2.	they	I	Positive	find
3.	This	I	Positive	suggests
4.	they	I	Positive	calibrate
5.	They	I	Positive	estimate
6.	This	I	Positive	fits
7.	The Berkeley researchers	I	Positive	extrapolate
8.	They	I	Positive	conclude

Group: BL2
Extract: BL2:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	We	I	Positive	infer
2.	This inference	I	Positive	comes
3.	we	I	Positive	minimize
4.	It	I	Positive	follows

5.	The second implication of the tree (Fig.3) that each non-African population has multiple origins	I	Positive/Possible	can be illustrated
6.	[Imperative; Subject omitted]	O	Positive	Take
7.	Asian lineage 50	I	Positive	is
8.	Six other lineages	I	Positive	lead
9.	This small region of New Guinea (mainly	I	Positive/Presumptive	seems to have been colonised
10.	we	I	Positive	calculate
11.	Each estimate	I	Positive	is based
12.	This numbers, ranging from 15 to 36 (Tables 2 and 3)	I	Positive/Possible	will probably rise
13.	A time scale	I	Positive/Possible	can be affixed
14.	One way of estimating this rate	I	Positive	is
15.	People	R	Positive	colonised
16.	These times	I	Positive	enable
17.	a detailed account of this calculation	I	Positive	appears
18.	This rate	I	Positive	is
19.	We	I	Positive	consider
20.	the common ancestral mtDNA (type a)	I	Positive	links
21.	this	I	Positive	implies
22.	ancestral b-j	I	Positive/Possible	may have existed
23.	the migrations from Africa	R	Positive	did...take place
24.	The oldest of the clusters of mtDNA types to contain no African members	I	Positive	stems
25.	[Subject as 24.; omitted]	R	Positive	included
26.	The apparent age of this cluster (calculated in Table 3)	I	Positive	is
27.	Its founders	I	Positive/Possible	may have left
28.	it	I	Positive	is
29.	The mtDNA results	I	Negative/Possible	cannot tell

Group: BP2
Extract: BP2:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	What	[Minor clause: verbless]		
2.	not enough data	I	Positive	exist
3.	Studies of the Y chromosome	R	Positive/Possible	might provide
4.	the Y chromosome	I	Positive	transmits
5.	women	I	Positive	have
6.	men	[Verb as 5.; omitted]		
7.	DNA probes	R	Positive/Possible	could search
8.	The results	R	Positive/Possible	could be employed
9.	you	R	Positive/Possible	might expect
10.	[Imperative; Subject omitted]	O	Positive	Suppose
11.	This	I	Positive	is illustrated
12.	seven of the mitochondrial lineages	I	Positive	are lost
13.	two	I	Positive	persist
14.	polygyny, with some males having more than one mate	R	Positive/Hypoth	would result
15.	Y lineages	R	Positive/Hypoth	would vanish
16.	The "common paternal ancestor", call him Adam, from whom all the current lineages diverged	R	Positive/Possible	might...have lived
17.	Eve	I	Positive/Possible	may have lived
18.	The point	I	Positive	is
19.	The hypothesis	R	Positive/Oblig	should be qualified

20.	the statement "typical mammalian females... behave as haploids"	I	Positive	is
21.	recent studies in cows	I	Positive	have shown
22.	an individual cow	I	Positive/Possible	may contain
23.	a new mitochondrial mutation	I	Positive	does...become established
24.	[Imperative; Subject omitted]	O	Positive	Suppose
25.	this mutated genome alone	R	Positive/Possible	could... populate
26.	The simplest explanation	I	Positive	is
27.	the individual	R	Positive	might be
28.	it	I	Positive	is
29.	one or other mitochondrial population	I	Positive	takes over
30.	a mutation	I	Positive	is
31.	a rare paternal contribution or some kind of recombination event	[Minor clause; verbless]		
32.	Any of these	R	Positive/Hypoth	would complicate
33.	The "mitochondrial clock hypothesis"	I	Positive	assumes
34.	researchers	I	Positive	find
35.	researchers relying on the accumulation of	R	Positive/Hypoth	would need
36.	The Mother Eve hypothesis	I	Positive	is
37.	The study of mitochondrial lineages	I	Positive/Certain	will doubtless help

Group: BL2
Extract: BL2:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Studies of mtDNA	I	Positive	suggest
2.	More extensive molecular comparisons	I	Positive	are needed
3.	This	I	Positive/Possible	may provide
4.	It	I	Positive	is
5.	it	I	Positive/Possible	may be
6.	a fuller interaction between palaeo-anthropology, archaeology and molecular biology	I	Positive/Certain	will allow

Group: BP3
Extract: BP3:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Ceaseless persecution and the loss of suitable habitat	R	Positive/Degree	nearly saw
2.	Only a relaxation in the zeal of gamekeepers and the rapid spread of coniferous plantation after the First World War	I	Positive	have allowed
3.	a more insidious fate	I	Positive/Possible	may be awaiting
4.	the threat	I	Positive	comes
5.	The Scottish wild cat and its European cousins	I	Positive	are
6.	The African form of the wild cat	I	Positive	resembles
7.	[Subject as 6.; omitted]	I	Positive	look
8.	The African wild cat	I	Positive	is
9.	They	R	Positive/Possible	were possibly ...domesticated
10.	[Subject as 9.; omitted]	I	Positive/Certain	are definitely known
11.	The mummified remains of domestic cats	R	Positive	were
12.	The domestic cat	I	Positive	has travelled
13.	cats	I	Positive	have...been
14.	its place as the main predator of rodents and rabbits	R	Positive	was taken
15.	it	R	Positive	came
16.	hybridisation	R	Positive	was

17.	Don French and Laurie Corbett of the Institute for Terrestrial Ecology, Banchory and Nigel Easterbee of the Nature Conservancy Council in Edinburgh	I	Positive	have investigated
18.	The results of their study	I	Positive	suggest
19.	The Scottish wild cat	R	Positive/Possible	could be inundated
20.	It	I	Negative	is not
21.	a careful analysis of several skull measurements	I	Positive/Possible	can reveal

Group: BL3
Extract: BL3:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Wildcats (_Felis silvestris_)	R	Positive	were
2.	they	R	Positive	had disappeared
3.	[Subject as 2.; omitted]	R	Positive	[had] become
4.	Domestic cats (_F. catus_)	R	Positive	were introduced
5.	feral domestic cats	I	Positive	are
6.	there	I	Positive	has been
7.	This increase	I	Positive/Possible/ Degree	may have been partly due
8.	[Subject as 7.; omitted]	I	Positive/Possible	may...have been
9.	There	I	Positive	are
10.	few	I	Positive	have been authenticated
11.	Many authors	I	Positive	have attempted
12.	All these studies	R	Positive	had
13.	many analyses	I	Positive	use
14.	even ratio measurements	I	Positive/Possible	may give
15.	we	I	Positive	aim
16.	We	I	Positive	attempt
17.	We	I	Positive	assume
18.	this method	R	Positive/Possible	should reflect
19.	we	R	Positive/Hypoth	would expect

20.	This paper	R	Positive	aimed
21.	Wildcat samples	R	Positive	were classified
22.	skull measurements of these three groups together with samples of hybrid and domestic cats	R	Positive	were compared
23.	All analyses	R	Positive	showed
24.	There	R	Positive	was
25.	Both groups	R	Positive	were separated
26.	The hybrid group	R	Positive	was
27.	it	R	Positive	overlapped
28.	FLDF	R	Positive	produced
29.	Wildcats	R	Positive	had
30.	all the distinguishing variables	R	Positive	were
31.	Sexes	R	Positive	were
32.	We	R	Positive	concluded
33.	Most hybridization	R	Positive/Possible	probably occurred
34.	The increase in 'wildcat' numbers over the past 50 years or so	I	Positive/Possible	may...include
35.	It	R	Positive/Possible	was probably aided
36.	'Modern' wildcats	I	Positive/Usuality	tend to be
37.	it	I	Positive/Possible	may be

Group: BP3
Extract: BP3:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	French and his co-workers	R	Positive	discovered
2.	they	R	Positive/Presumptive	would have had
3.	[Subject as 2.; omitted]	R	Positive/Presumptive	would have resorted

Group: BL3
Extract: BL3:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The overall pattern	I	Positive	is
2.	recent and modern wildcats	R	Positive	overlapped
3.	This	R	Positive	was
4.	the component scores (Fig. 5)	I	Positive/Usuality	consistently suggest
5.	This	I	Positive	corroborates
6.	Additional support fro this conclusion	I	Positive	is given
7.	old wildcats	R	Positive/Usuality	were always
8.	Distance between domestic cats and hybrids	R	Negative	were not
9.	recent wildcats	R	Positive/Usuality	were always
10.	the results	I	Positive	imply
11.	domestic cats and old wildcats	I	Positive/Presumptive	appear to be
12.	modern and recent wildcats	I	Positive	do include

13.	Differences between sexes within groups (Table V)	R	Positive	showed
14.	Recent and modern wildccats	R	Positive	were
15.	Hybrids	R	Positive	showed
16.	what difference there was	R	Positive	was
17.	the largest variation within group and sex (measured by mean difference from group/sex centroid, with recent and modern wildcats combined as a single group)	R	Positive	was
18.	This	R	Positive/Usuality	was usually
19.	Recent and modern wildcats	R	Positive	were
20.	It	R	Positive	was
21.	the results	I	Positive	imply
22.	There	I	Positive/Presumptive	seems to have been
23.	the likely causes of this change	I	Positive	are
24.	Hybridization	I	Positive/Possible	may have occurred
25.	wildcat numbers	R	Positive	were
26.	Forests	I	Positive	provide
27.	Corbett (1978, 1979)	R	Positive	showed
28.	He	R	Positive	described
29.	they	I	Positive/Possible	may have had
30.	such crossbreeding	R	Positive/Presumptive/ Usuality	Normally..would be prevented
31.	the combination of low wildcat numbers and a high density of feral domestic cats	I	Positive/Possible	may have reduced

Group: BP3
Extract: BP3:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	there	I	Positive/Usuality	From time to time...are
2.	these fearsome felines	I	Positive	are
3.	Some	I	Positive	take
4.	they	R	Positive/Desirable	Unfortunately ...chose
5.	Some of these cats, but very few	I	Positive	are
6.	The Surrey Puma	R	Positive	was sighted
7.	[Subject as 6.; omitted]	I	Positive/Possible	probably falls
8.	two leopard cats, so named because of their spots not their size	R	Positive	were found
9.	These	R	Positive/Certain	were definitely
10.	The large black Kellas cats	I	Positive	have received
11.	these animals	I	Positive/Certain	without any doubt...are
12.	[Subject as 11.; omitted]	I	Positive	are
13.	we	R	Positive/Presumptive	would expect
14.	Nigel Easterbee	R	Positive	came across
15.	It	I	Negative/Certain/ Possible	will probably not be

Group: BL3
Extract: BL3:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Distinguishing hybrids from domestic cats	I	Positive/Possible	may..be
2.	one cat in our sample	R	Positive	was...thought
3.	[Subject as 2.; omitted]	R	Positive/Usuality	was constantly misclassified
4.	Subsequent examination of other characteristics (e.g. intestine length)	R	Positive	indicated
5.	The doubtful reliability of pelage characters as a guide to identifying hybrids	R	Positive	was confirmed
6.	a series of large black cats trapped or shot in Morayshire (see e.g. Steele, 1985 for a typical press account)	I	Positive	have...been

Group: BP3
Extract: BP3:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The Scottish wild cat	I	Positive/Presumptive	does seem to be threatened
2.	there	I	Positive/Possible	may be
3.	A sample of skulls from the 1970s	R	Positive	were
4.	It	I	Positive	is
5.	a new type of wild cat	I	Positive/Possible	may have evolved
6.	The trouble with skull measurements	I	Positive	is
7.	Nigel Easterbee	I	Positive	is trying
8.	He	I	Positive	is...working
9.	It	R	Positive/Presumptive	should be
10.	The work	I	Positive	has...begun
11.	It	I	Positive	is

Group: BL3
Extract: BL3:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	What future changes	I	Positive	are
2.	Numbers of 'wildcats'	I	Positive	have increased
3.	the two events	I	Positive	are
4.	Our results	I	Positive	suggest
5.	there	I	Positive	are
6.	We	I	Positive	suggest
7.	Whether 'pure' wildcats will ever become re-established	I	Positive/Possible	can...be determined
9.	A revision of the analyses reported here after, say, 20 years or so	R	Positive/Possible	could show

Group: CP1
Extract: CP1:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The Chinese philosopher Seng-Ts'an	R	Positive	wrote
2.	that confusion	I	Positive/Possible	Perhaps...is
3.	Cognitive scientists	I	Positive	try
4.	We	I	Positive	have
5.	we	I	Positive/Possible	Perhaps...have relied
6.	Cognitive science	I	Positive	is
7.	it	I	Positive	is centred
8.	it	I	Positive	shares
9.	Two distinct traditions	I	Positive	are emerging
10.	One, which for convenience I shall call the "mind's eye approach"	I	Positive	accepts
11.	The other	I	Positive	is based
12.	This newer approach	I	Positive/Possible	may enable

Group: CL1
Extract: CL1:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	PDP (Parallel Distributed Processing a.k.a. Connectionism)	I	Positive	is
2.	It	I	Positive	has
3.	I	I	Positive/Certain	shall suggest
4.	I	I	Positive	suggest
5.	My strategy	I	Positive/Certain	will be
6.	I	I	Positive	sketch
7.	[Subject as 6.; omitted]	I	Positive	report
8.	I	I	Positive	focus
9.	I	I	Positive	propose

Group: CP1
Extract: CP1:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The mind's eye approach	R	Positive	was
2.	It	I	Positive	focuses
3.	These cognitive achievements	I	Positive	include
4.	Striking achievements	[Minor clause: verbless]		
5.	Researchers	R	Positive	devised
6.	Computers	R	Positive	played
7.	they	R	Positive	rediscovered
8.	They	R	Positive	learnt
9.	They	R	Positive/Possible	could answer
10.	something	R	Positive?Presumptive	seemed to be
11.	The programmed computers	R	Positive	lacked
12.	They	R	Positive/Possible	could perform
13.	they	R	Positive	performed
14.	[Subject as 13.; omitted]	R	Positive	made
15.	The mind's eye approach	I	Positive/Possible	may err
16.	Many of the programs	I	Positive	echo
17.	a researcher	R	Positive/Possible	might write
18.	Such a program	R	Positive/Possible	might isolate
19.	[Subject as 18.; omitted]	R	Positive/Possible	[might] allow
20.	Such an approach	I	Positive	follows
21.	We	I	Positive	explain
22.	we	I	Positive	say
23.	this approach	I	Positive	assumes

24.	[Imperative; Subject omitted]	O	Positive	suppose
25.	Talk about beliefs and desires	I	Positive	is
26.	such talk	I	Negative/Necessary	need not give
27.	We	I	Positive	have
28.	a computational investigation	R	Positive/Possible	might...proceed
29.	One alternative	I	Positive	is
30.	American high school yearbooks	I	Positive	single out
31.	the list of star qualities	I	Positive	is
32.	It	I	Positive	includes
33.	The most basic life-forms	I	Positive/Necessary	must solve
34.	Hamsters and even slugs	I	Positive	solve
25.	Such achievements	I	Negative	are not
26.	the secret of real intelligence	I	Positive/Possible	may be contained
27.	Our ability to reason	I	Positive/Possible	may be due

Group: CL1
Extract: CL1:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Mixed models	I	Positive	require
2.	Not just different cognitive tasks, but different aspects of the same task	I	Positive	look
2.	some form of mixed model	I	Positive/Possible	may well be
3.	The apparent success of thoroughly soft PDP systems in negotiating such domains (e.g. the model of past tense acquisition)	I	Positive/Possible	may be due
4.	the system	R	Positive	received
5.	Pinker and Prince	I	Positive	describe
6.	even the Rumelhart and McClelland system	I	Positive	has
7.	the consequences	I	Positive/Necessary	must include
8.	correct explanations	I	Positive/Necessary	must be geared
9.	All of which	I	Positive	is
10.	I	I	Positive	am
11.	It	R	Positive/Hypoth	would be
12.	[Imperative; Subject omitted]	O	Positive	See
13.	The power behind our gross symbol processing capacities -- the factor (or one factor) which makes us thinkers and e.g. SHRDLU not	I	Positive/Possible	may well be
14.	There	I	Positive	is
15.	The intuition	I	Positive/Frequ	is often put
16.	our notion of understanding	I	Positive/Possible	Perhaps... involves

17.	This position	I	Positive/Degree	is most strongly advanced
18.	it	R	Positive/Hypoth	would seem
19.	This	I	Positive/Certain	certainly fits
20.	We...(many of us)	I	Positive	allow
21.	we	I	Positive	deny
22.	we	R	Positive/Obligatory	should maintain
23.	we	R	Positive/Obligatory	should hold
24.	we	I	Positive/Possible	may...hold
25.	The Virtual Symbol Processor	I	Positive	provides
26.	The PDP substrate	I	Positive	provides
27.	Subsymbolic processing without symbolic guidance	I	Positive	is
28.	Symbolic processing without subsymbolic support	I	Positive	is

Group: CP1
Extract: CP1:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Neural networks, of the kind found in slugs, hamsters, monkeys and humans	I	Positive	are
2.	The relative slowness of the individual processors	I	Positive	is
3.	A useful analogy	I	Positive	captures
4.	we	I	Positive	find
5.	Local constraints	I	Positive	govern
6.	the system as a whole	I	Positive	settles
7.	we	I	Positive/Possible	can say
8.	Vision and sensori-motor control	I	Positive	are
9.	Such networks	I	Positive/Possible	can perform
10.	each neuron (or group of neurons)	I	Positive	is primed
11.	These neurons	I	Positive	are linked
12.	Neurons with compatible contents	I	Positive	form
13.	we	I	Positive	build up
14.	the computational work	I	Positive	is done
15.	Parallel networks or "connectionist machines"	I	Positive	yield
16.	The first of these	I	Positive	is
17.	This	I	Positive	is
18.	the excitatory and inhibitory connections between units	I	Positive	complete

19.	The network	I	Positive/Possible	can complete
20.	Such a network	I	Positive/Possible	can...continue
21.	this	R	Positive/Hypoth	would correspond
22.	animals	I	Positive/Necessary	need to make
23.	Graceful degradation	I	Positive	makes for
24.	The second benefit I wish to mention	I	Positive	is
25.	I	I	Positive	call
26.	It	I	Positive	involves
27.	[Imperative; Subject omitted]	O	Positive	suppose
28.	The network	R	Positive/Hypoth	would store
29.	These units	I	Positive	are linked

Group: CL1
Extract: CL1:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Parallel Distributed Processing	I	Positive	is
2.	a general type of architecture and a set of properties	I	Positive	is
3.	The type of architecture	I	Positive	involves
4.	These positively or negatively weighted connections	I	Positive	encode (or come to encode)
5.	we	I	Positive/Possible	may conceive
6.	The unit	I	Positive	fires
7.	Two units which stand for contradictory hypotheses	I	Positive/Possible	may...be linked
8.	it	I	Positive/Certain/ Usuality	will tend to inhibit
9.	Mutually supporting hypotheses	I	Positive/Possible	may be linked
10.	The links	I	Positive	allow
11.	The state of a unit at a given time	I	Positive/Certain/ Degree	will depend in part
12.	those units	I	Positive/Certain	will be influenced
13.	An iterative process of mutual adjustment of response	I	Positive	ensues
14.	This process	I	Positive/Usuality	is sometimes called

15.	[Imperative; Subject omitted]	O	Positive	suppose
16.	Each unit	I	Positive	is primed
17.	It	I	Positive	must...listen
18.	the global network	R	Positive/Oblig	should relax
19.	This	I	Positive/Certain	will amount
20.	the system	R	Positive/Oblig/ Usuality	should (often) get
21.	The essential point to note	I	Positive	is
22.	Parallelism alone	I	Negative	is not
23.	a process of cooperative group decision	I	Positive	is
24.	Cooperative algorithms	I	Positive	work
25.	Cooperation	I	Positive	is
26.	A homely example (which I first heard from J. Stone)	I	Positive	is
27.	global patterns of supply and demand	I	Positive	are established
28.	Overall knowledge of demand	I	Positive	is... distributed
29.	The way of encoding and retrieving specific information	I	Positive	results
30.	This	I	Positive	is
31.	they	I	Positive	exhibit
32.	no special mechanism	I	Positive	is required
33.	the hypotheses	I	Negative	are not... stored
34.	It	I	Positive/Possible	is perhaps
35.	it	I	Positive	becomes
36.	this	I	Positive/Presumtive	seems...to amount
37.	that such rules depend on no special mechanism of rule-generation and storage and are represented in a manner which makes them extremely flexible and sensitive to contextual nuances	I	Positive	is
38.	it	I	Positive	is

Group: CP1
Extract: CP1:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	it	I	Positive/Usuality	does look, at times
2.	we	I	Positive/Presumptive	seem to move
3.	One theory which attempts to account for this phenomenon	R	Positive	was... propounded
4.	They	I	Positive	suggest
5.	The notion of simulation	I	Positive	is
6.	[Subject as 5.; omitted]	I	Positive/Necessary	needs to be treated
7.	A standard digital computer	I	Positive/Possible	can be set up
8.	it	I	Positive	simulates
9.	a connectionist brain	R	Positive/Possible	could... simulate

Group: CL1
Extract: CL1:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	So much for the good news.	[Minor clause; verbless]		
2.	PDP models	I	Positive/Assertive/ Presumptive	do indeed seem to provide
3.	Now for the bad news.	[Minor clause; verbless]		
4.	Psychologically realistic models of our performance of some tasks	I	Positive/Possible	can be obtained
5.	Hence a dilemma:...	[Minor clause: verbless]		

Group: CP1
Extract: CP1:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The intriguing answer suggested by McClelland and Rumelhart	I	Positive	is
2.	[Imperative; Subject omitted]	0	Positive	take
3.	They	I	Positive	suggest
4.	we	I	Positive	complete
5.	This ability	I	Positive	is combined
6.	We	I	Positive	deploy
7.	777 x 777	I	Positive	is reduced
8.	the result	I	Positive	[is] read off
9.	The first three such operations	I	Positive	are
10.	we	I	Positive	learn
11.	the kind of explicit, conscious reasoning that the mind's eye approach used as its model of the underlying architecture of thought	I	Positive/Assertive	is really
12.	It	I	Positive	is
13.	it	I	Positive	depends
14.	this	R	Positive/Hypoth	would be
15.	it	I	Positive	has come

Group: CL1
Extract: CL1:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Pinker and Prince (1988)	I	Positive	argue
2.	we	R	Positive	chose
3.	These	R	Positive	suggested
4.	accepting this	I	Negative/Necessary	need not lead
5.	we	R	Positive	developed
6.	This	I	Positive	is
7.	PDP or not PDP	I	Negative/Assertive	is simply not
8.	Cognitive science	I	Positive/Possible/ Necessary	may need to recognise
9.	any full and satisfying account	I	Positive/Possible	may require
10.	Recognition of this architectural multiplicity	I	Positive/Possible	may be

Group: CP2
Extract: CP2:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Industrial robots working alongside humans on an assembly line	I	Positive	look
2.	most industrial robots	I	Positive	are
3.	Robots	I	Positive	are
4.	Most of the investment in a robot	I	Positive	is spent
5.	Much of the inherent flexibility of a robot	I	Positive	is wasted
6.	Researchers all over the world	I	Positive	want
7.	They	I	Positive	want
8.	The most dramatic advances in robotics	I	Positive/Possible	may come
9.	The ability to interpret images taken by a television camera	I	Positive/Hypoth	would enable

Group: CL2
Extract:CL2:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	A fundamental capability of human vision	I	Positive	is
2.	this high level of performance	I	Positive	is achieved
3.	Methods	I	Positive	are known
4.	this knowledge itself	I	Positive	is

Group: CP2
Extract: CP2:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The ease with which people perform common visual tasks -- such as raising our eyes from a page and immediately recognising the objects in our surroundings --	R	Positive/Possible	could mislead
2.	human vision	I	Positive	involves
3.	each person	I	Positive	accumulates
4.	that any object has an infinite number of different images, depending on variables such as viewpoint and the position and characteristics of the light source.	I	Positive	is
5.	parts of the object	I	Positive/Possible	may be hidden
6.	we	I	Positive	know
7.	We	I	Positive/Possible/ Usuality	can usually recognise
8.	it	I	Positive	is
9.	it	I	Positive	is
10.	vision	I	Positive	has
11.	we	I	Positive	know
12.	It	I	Positive	is
13.	A basic problem	I	Positive	is
14.	many objects	I	Positive	look
15.	There	I	Positive	is

16.	an object's appearance	I	Negative/Degree	does not change drastically
17.	many features	I	Positive	stay
18.	Such stable features in an image and combinations of different, stable features	I	Positive	identify
19.	we	I	Positive	have
20.	we	I	Positive	do know
21.	the object's other features	I	Positive/Necessary	must be
22.	Any initial matches between edges in the image and edges of the computer's model	I	Positive	are

Group: CL2
Extract: CL2:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	we	I	Positive	examine
2.	the effective application of such a strong constraint	I	Positive	leads
3.	The particular constraint that we will be examining	I	Positive/Possible	can be stated
4.	The ease of stating this constraint	I	Positive	is
5.	The mathematical and practical problems of implementing it	I	Positive	have been
6.	Some systems	I	Positive	have ignored
7.	the importance of this constraint for achieving robust recognition	I	Negative/Possible	can hardly be overstated
8.	we	I	Positive/Certain	will argue
9.	any attempt to recognize an object without application of the viewpoint consistency constraint	I	Positive/Certain	will end up
10.	Low-level vision	I	Positive	has proved
11.	low-level vision	I	Positive	provides
12.	It	I	Positive	is
13.	A second area of bottom-up image analysis	I	Positive	has focused
14.	in themselves these region descriptions	I	Positive	are
15.	spatial correspondence	I	Positive/Frequ	is often

Group: CP2
Extract: CP2:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The simplest example of the identification of stable features	I	Positive	is
2.	Edges	I	Positive	appear
3.	They	I	Positive	occur
4.	Edges	I	Positive	remain
5.	Studies of the early stages of visual processing in the brain	I	Positive	show
6.	None of the numerous computational techniques to detect changes in intensity and form edge-like structures	R	Positive	had
7.	the detection of edges	I	Positive	is
8.	there	I	Positive	is
9.	Human vision	I	Positive	gives
10.	A computer	I	Positive/Possible	can apply

Group: CL2
Extract: CL2:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The seminal work of Roberts [22] in the early 1960s	R	Positive	contained
2.	His vision system	R	Positive	began
3.	The interpretation process	R	Positive	assumed
4.	sets of matches	R	Positive	were hypothesized
5.	His method for performing spatial verification	R	Positive	assumed
6.	[Subject as 5.; omitted]	R	Positive	required
7.	The resulting solution	R	Positive	was
8.	the mean-square error	R	Positive	was used
9.	these methods	R	Positive	had
10.	It	I	Positive	is

Group: CP2
Extract: CP2:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	a single rigid model	I	Negative/Predictive	Of course..does not capture
2.	Many objects	I	Positive	have
3.	an object	I	Negative/Possible	may not have
4.	Some vision systems	I	Positive/Possible	can manipulate
5.	it	I	Positive/Certain	will become
6.	robots	I	Positive/Certain	will need

Group: CL2
Extract: CL2:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	One argument that is sometimes advanced against the use of precise spatial correspondence	I	Positive	is
2.	It	I	Positive	is
3.	advances	I	Positive	will be made
4.	Our knowledge of the visual appearance of objects	I	Positive	includes
5.	To simply discard all of the available spatial information because some of it is not fully constrained	R	Positive/Hypoth	would result
6.	It	I	Positive	is

Group: CP2
Extract: CP2:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The first step in recognition	I	Positive	is
2.	it	I	Positive/Desid've	Unfortunately is
3.	The equations	I	Positive	are
4.	they	I	Positive	have
5.	The computer	I	Positive/Necessary	needs to adopt
6.	The mathematical technique we adopted at New York University	I	Positive	is
7.	The method	I	Positive	starts
8.	[Subject as 7.; omitted]	I	Positive	measures
9.	Newton's method	I	Positive	calculates
10.	[Subject as 9; omitted]	I	Positive	minimises
11.	it	I	Positive	projects
12.	[Subject as 11.; omitted]	I	Positive	predicts
13.	it	I	Positive	adjusts
14.	The process	I	Positive	ceases
15.	we	I	Positive/Possible	can expect
16.	it	I	Positive	is
17.	there	I	Positive/Certain Possible	will likely be
18.	it	I	Positive	remembers
19.	[Subject as 18.; omitted]	I	Positive	removes
20.	the number of remaining edges in the image	I	Positive	become
21.	the search area	I	Positive	decreases
22.	the search	I	Positive	ends
23.	many uninterpreted edges	I	Positive/Frequ	Usually... remain

Group: CL2
Extract: CL2:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The viewpoint consistency constraint	I	Positive	is
2.	the initial bottom-up stages of vision	I	Positive/Necessary	must detect
3.	human vision	I	Positive	does have
4.	The SCERPO vision system	I	Positive	begins
5.	Figure 4	I	Positive	shows
6.	Edges	I	Positive	are detected
7.	Straight line segments	I	Positive	are detected
8.	a grouping process	I	Positive	is executed
9.	The methods for perceptual organization	I	Positive	are
10.	the reader	I	Positive	is referred
11.	The groupings	I	Positive	are matched
12.	the groupings	I	Positive	are used
13.	Matches between an object and the image that are based simply upon viewpoint-invariant properties	I	Positive/Certain/ Necessary	will necessarily be
14.	The viewpoint consistency constraint	I	Positive/Possible Degree	can greatly improve
15.	Figure 6	I	Positive	shows
16.	Figure 6a	I	Positive	shows
17.	The grouping	I	Positive	satisfies
18.	[Subject as 17.; omitted]	I	Positive	is matched
19.	The remainder of figure 6	I	Positive	follows
20.	The initial viewpoint estimate for the model (shown in figure 6a in dark blue)	I	Positive	is made
21.	This	I	Positive	is...refined

22.	the identified segments	I	Positive	are marked
23.	[Subject as 22.; omitted]	I	Positive	are... considered
24.	the search space	I	Positive/Assertive	actually decreases
25.	The final results of this process	I	Positive	are shown
26.	more than 15 image segments	R	Positive	were matched
27.	all the remaining matches	I	Positive	provide
28.	we	I	Positive/Possible	can have
29.	Figure 9	I	Positive	shows
30.	Each edge in this image	I	Positive	is drawn
31.	The total computation time expended on this example	R	Positive	was
32.	it	R	Positive/Possible/ Possible	it could probably be speeded up
33.	All of the code beyond the edge detection stage	I	Positive	is written

Group: CP2
Extract: CP2:6

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	It	I	Positive/Possible	may be
2.	there	I	Positive	is
3.	More primitive forms of computer vision	I	Positive	are
4.	Vision	I	Positive	is
5.	it	I	Positive/Certain	will play

Group: CL2
Extract: CL2:6

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Application of the viewpoint consistency constraint	I	Positive/Degree	greatly simplifies
2.	This constraint	I	Positive	is
3.	Bottom-up processing	I	Positive/Necessary	need...function
4.	[Subject as 3.; omitted]	I	Positive/Necessary	[need] provide
5.	the bottom-up description of an image	I	Positive	is aimed
6.	These groupings	I	Negative	are not used
7.	[Subject as 6.; omitted]	I	Positive	serve
8.	Actual identification	I	Positive	is based
9.	[Subject as 8.; omitted]	I	Positive	maps
10.	The matching process presented in this paper	I	Positive	is based
11.	This approach	I	Positive	contrasts
12.	The individual probabilistic analysis of each match	I	Positive/Possible	can be used
13.	[Subject as 12.; omitted]	I	Positive	leads
14.	It	I	Positive	is

Group: CP3
Extract: CP3:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	nine women	R	Negative/Necessity	shouldn't be able
2.	Some tasks	I	Negative/Possible	cannot be performed
3.	it	I	Positive/Freq	Sometimes...is
4.	Conventional computers	I	Positive	contain
5.	[Subject as 4.; omitted]	I	Positive/Possible	can do
6.	There	I	Positive	are
7.	today's most advanced processors	I	Positive	are approaching
8.	A parallel computer	I	Positive	contains
9.	There	I	Positive	is
10.	parallel computers	I	Positive	are
11.	This reliability	I	Positive	is
12.	they	I	Positive	create
13.	Many of the techniques used on conventional computers	I	Positive	turn out
14.	parallel programs	I	Positive/Freq	often encounter
15.	many of these difficulties	I	Positive	are
16.	There	I	Positive	are

Group: CL3
Extract: CL3:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	we	I	Positive	describe
2.	This work	I	Positive	is
3.	This last	I	Positive	is
4.	this multidisciplinary work	I	Positive	has been sustained
5.	we	R	Positive	received
6.	Reviews and references to the work on these machines	I	Positive	are given
7.	The structure of this paper	I	Positive	is
8.	We	I	Positive	begin
9.	Section 3	I	Positive	gives
10.	Specific examples	I	Positive	are discussed
11.	we	I	Positive	summarise

Group: CP3
Extract: CP3:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	We	I	Positive/Possible	can divide
2.	The first	I	Positive	are known
3.	the second	[Verb as 2.; omitted]		
4.	all the processors	I	Positive	carry out
5.	it	R	Positive/Hypoth	would store
6.	Each processor	R	Positive/Hypoth	would...square sum and take a root
7.	a parallel-data computer	R	Positive/Possible	could produce
8.	each processor	I	Positive	has
9.	This	I	Positive/Possible	may be
10.	some processors	I	Positive/Hypoth	would run

Group: CL3
Extract: CL3:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	There	I	Positive	are
2.	SIMD (Single Instruction Multiple Data) computers	I	Positive	execute
3.	each processor	I	Positive	runs
4.	the processors	I	Positive/Necessary/ Possible	must be able to to communicate
5.	SIMD machines	I	Positive/Freq	usually have
6.	There	I	Positive	are
7.	all the processors	I	Positive	communicate
8.	The bus	I	Positive/Necessary	must be
9.	[Subject as 8; omitted]	I	Positive/Necessary	must contain
10.	The BBN Butterfly Computer	I	Positive	is
11.	that each processor should have its own memory, and should communicate with a small number of other processors via point-to-point links.	I	Positive	is
12.	Data in the memory of one processor that is required by another	I	Positive/Necessary	must be passed
13.	The Intel Hypercube, Ncube and Meiko Computing Surface	I	Positive	are

Group: CP3
Extract: CP3:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Parallel computers of both types	I	Positive	are...being manufactured
2.	The Distributed Array Processor or DAP	I	Positive	is
3.	The DAP	I	Positive	is
4.	Each DAP	I	Positive	contains
5.	The processing elements	I	Positive	are arranged

Group: CL3
Extract: CL3:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The DAP, Ref 3	I	Positive	is
2.	There	I	Positive	are
3.	All PEs	I	Positive	obey
4.	[Imperative; Subject omitted]	O	Positive	See
5.	The DAP	I	Positive	is
6.	A=B*C	I	Positive/Certain	will produce
7.	A masking facility	I	Positive	allows

Group: CP3
Extract: CP3:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Transputers	I	Positive	have been
2.	they	I	Positive	have
3.	One such application	I	Positive	is
4.	The images	I	Positive	are built up
5.	the point	I	Positive	takes on
6.	the system	I	Positive	generates
7.	One application of ray tracing	I	Positive	is
8.	a designer	I	Positive/Possible	can...create
9.	the program	I	Positive	assigns
10.	They	I	Positive	calculate
11.	[Subject as 10.; omitted]	I	Positive	receive
12.	The transputers	I	Positive	process
13.	Each transputer	I	Positive/Possible	can work
14.	that work is automatically distributed among available processors more or less evenly	I	Positive	is
15.	This sort of calculation	I	Negative	is not
16.	the DAP	R	Negative/Possible	could not process
17.	the inclusion of a high bandwidth bus for getting data to and from the processors quickly	R	Positive	was

18.	These conventional algorithms	I	Positive	produce
19.	You	I	Positive/Possible	can do
20.	it	I	Positive	is
21.	The transputer	I	Positive	is
22.	Applications under development	I	Positive	include

Group: CL3
Extract: CL3:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The image restoration algorithm of Geman and Geman	I	Positive	is applied
2.	The scheme employed for optimising the corresponding cost function	I	Positive	involves
3.	The parameters of the cost function	I	Positive	are embedded
4.	Solutions	I	Positive	are found
5.	the network	I	Positive	settles
6.	The connection strengths	I	Positive	are
7.	We	I	Positive	have implemented
8.	The algorithm	R	Positive	was applied
9.	the state of half the neurons	I	Positive/Possible	may be updated
10.	The other half of the pixels	I	Positive/Possible	may...be... updated
11.	This parallelism	R	Positive	was exploited
12.	the rate of updating on the DAP	R	Positive	was
13.	Between 1000 and 3000 sweeps (equivalent to between 1 and 3 neuron time constants)	R	Positive	were
14.	The performance of the restoration by this analogue neural network method	R	Positive	was compared
15.	A third restoration method, performing a gradient descent	R	Positive	was achieved
16.	The analogue neural network method	I	Positive/Freq	consistently finds

17.	Murray et al	I	Positive	report
18.	We	I	Positive	implement
19.	The update	I	Positive	is performed
20.	we	I	Positive	need
21.	we	I	Positive	transfer
22.	we	I	Positive	update
23.	The implementation of the Computing Surface	I	Positive	uses
24.	Information on the state of each neuron	I	Positive	is sent
25.	The cost of splitting processing between many processors	I	Positive	is

Group: CP3
Extract: CP3:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The DAP and the transputer	I	Positive	are
2.	Many other variations on the theme	I	Positive	are
3.	We	I	Positive	have
4.	It	I	Positive/Possible	may seem
5.	the real objective	I	Positive	is
6.	Progress in the design of parallel computers	I	Positive/Certain	will make

Group: CL3
Extract: CL3:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The range of models studied in this paper	I	Positive	are
2.	[Subject as 1.; omitted]	I	Positive/Possible	can be... mounted
3.	this	I	Positive	is
4.	It	I	Positive	is
5.	it	I	Positive	is
6.	Two further comments	I	Positive	are
7.	it	I	Positive	is
8.	the realisation of this potential in real applications	I	Positive	is
9.	it	I	Positive	is
10.	the actual operation of a trained net	I	Negative/Possible	may not... require
11.	their use in neural modelling	I	Positive	is
12.	The integrated graphics capabilities of the Computing Surface	I	Positive	are

Group: HP1
Extract: HP1:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Urban history	I	Positive	has been
2.	the overlapping discipline of social history	I	Positive	has
3.	this	I	Positive	has reflected
4.	The richness of the sources, and the exciting evidence of growth, change and conflict	I	Positive	has attracted
5.	The results of some of this work, applying the developing concepts and research techniques of social history in an urban setting	I	Positive	are...beginning
6.	Recent debates over economy, society and and popular politics in the northern textile towns	I	Positive	have been
7.	Much of the new work	I	Positive	has...to make
8.	Only P.J. Waller, in his Town, City and Nation: England 1850-1914 (Oxford, 1983)	I	Positive	provides
9.	Waller	I	Positive	pays
10.	He	I	Positive	looks
11.	he	I	Positive	analyses
12.	The leisure towns	I	Positive	form
13.	this	I	Positive	is
14.	Social history historians	I	Positive	have been
15.	Local case studies	I	Positive	have multiplied
16.	attempts at comparative analysis and	I	Positive	have begun
17.	historians	I	Positive	have...found
18.	they	I	Positive/Possible	can...contribute

Group: HL1
Extract: HL1:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Victorian seaside resorts	R	Positive	were
2.	those which were expanding most spectacularly	R	Positive	were having to come to terms
3.	rising living standards	R	Positive	released
4.	tradesmen and whitecollar workers	R	Positive	predominated
5.	the skilled worker and his family	R	Positive	were

Group: HP1
Extract: HP1:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	the seaside holiday	R	Positive/Degree	was widely seen
2.	The introduction to a Newnes guide to the coast of Britain, a coffee-table book of the 1890s	I	Positive	encapsulates
3.	This compendium of Victorian commonplaces	R	Positive	was
4.	Many of 'the poorest among us'	R	Positive/Freq	never saw
5.	many others	R	Positive	saw
6.	the Lancashire cotton towns, which pioneered the seaside holiday as a mass experience	R	Positive	contained
7.	seaside reality	R	Positive	was
8.	The ideal of the seaside as refuge and and escape from urban pressure and industrial routine	R	Positive	coexisted

Group: HL1
Extract: HL1:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	All this	I	Positive	helps
2.	whole towns	R	Positive	had
3.	The fairgrounds	R	Positive	persisted
4.	they	R	Positive	were frequented
5.	The traditional amusements of the Wakes	R	Positive/Degree	had in large measure migrated
6.	this response to new opportunities, especially at Blackpool, itself	R	Positive	made
7.	textile Lancashire	R	Positive	led
8.	it	I	Positive	is
9.	there	R	Positive	were
10.	they	I	Positive/Presumptive	seem to be
11.	we	I	Positive/Certain/ Necessary	shall need to bear

Group: HP1
Extract: HP1:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Class conflict at the seaside	R	Positive	revolved
2.	it	R	Positive	was
3.	Most resorts	R	Positive	began
4.	they	R	Positive	developed
5.	the established visiting public and its resident allies and dependants	R	Positive	took
6.	They	R	Positive	feared
7.	they	R	Positive	viewed
8.	They	R	Positive	sought
9.	They	R	Positive	tried
10.	'Respectable' working-class visitors, who reacted passively to their surroundings and accepted a silent and subordinate place in the seaside scheme of things	R	Positive	were tolerated
11.	assertive trippers, who set out to enjoy themselves in their own way	R	Positive	were met
12.	large landowners in alliance with strong and single-minded local authorities	R	Positive/Possible	were able to defend
13.	large sections of a resort	R	Positive/Possible	could go
14.	This kind of conflict	R	Positive	was
15.	It	R	Positive	expressed
16.	it	R	Positive	exposed
17.	a more tolerant middle-class consensus	R	Positive	reached out
18.	All classes	R	Positive	mingled
19.	the classes	R	Positive	continued
20.	The social harmony of the Edwardian seaside such as it was	R	Positive	owed

Group: HL1
Extract: HL1:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	These developments	R	Positive	were
2.	The earliest railway excursions to the coast	R	Positive	both responded to and stimulated
3.	Sunday Schools, temperance societies, and paternalistic employers	R	Positive	were
4.	the enjoyment of cheap travel and the cult of sea bathing	R	Positive	had
5.	Many	R	Positive	patronized
6.	Ramsgate	R	Positive	found
7.	the railways	R	Positive	gave
8.	[Subject as 7.; omitted]	R	Positive	ran
9.	these open excursions, which often ran on Sundays, especially in the south of England	R	Positive	attracted
10.	The earliest days of cheap travel for the masses	R	Positive	saw
11.	the working-class seaside holiday as it grew out of the day excursion	R	Positive	catered
12.	they	R	Positive	posed
13.	[Subject as 12.; omitted]	R	Positive	offered
14.	The existing "better-class" visiting public	R	Positive/Freq	often reacted
15.	the new visitors	R	Positive	came
16.	some resorts	R	Positive	saw
17.	the commercialization of entertainment which was developing rapidly inland	R	Positive	made
18.	stalls and fairground attractions	R	Positive	were supplemented

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
19.	the organizers of Sunday School and temperance excursions	R	Positive	began
20.	the commercial excursions and the railways' own regular cheap holiday fares	R	Positive	dominated
21.	the popular resorts	R	Positive/Possible	were able to grow
22.	Such developments	R	Positive	depended
23.	The working-class day-tripper	R	Positive/Freq	never had
24.	some of the more thrifty and resourceful of the better-paid working-class visitors	R	Positive	contrived
25.	This	I	Positive/Possible	may well have been hapening
26.	a working-class accommodation industry	R	Positive	was clearly emerging
27.	This	R	Positive	was
28.	It	I	Positive/Possible	can be seen
29.	there	R	Positive	emerged
30.	the new pattern of demand	R	Positive	began
31.	The lifestyles of the new visitors	R	Positive/Freq	often generated
32.	the working-class season, augmenting as it did an already swelling rush to the sea by workers in the expanding white-collar occupations	R	Positive	provided
33.	Blackpool	I	Positive	provides
34.	Southend, Cleethorpes, Yarmouth, Scarborough, Morecambe and several others	I	Positive/Possible	can be seen
35.	the most rapid large-scale resort growth of the late nineteenth century	R	Positive	came
36.	it	R	Positive	was

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
37.	resorts like Southport, which had prospered in the mid-Victorian heyday of the solid middle-classes	R	Positive	found
38.	[Subject as 37.; omitted]	R	Positive	experienced
39.	the picture	I	Positive	is complicated
40.	Even Southend's remarkable surge of development at the turn of the century	R	Positive	was fuelled
41.	"better-class" resort growth	R	Positive	was beginning
42.	the survival of irregular working habits often associated with a deep attachment to a large number of customary festivals	R	Positive	inhibited
43.	most industrial workers	R	Positive	retained
44.	Day-trips	R	Positive	were
45.	only the skilled and supervisory groups among the working class	R	Positive	had
46.	Such working people	R	Positive/Freq	were usually
47.	[Subject as 46.; omitted]	R	Positive	were
48.	Conflicts	R	Positive	flared
49.	it	R	Positive	was

Group: HP1
Extract: HP1:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Different resorts	R	Positive	responded
2.	there	R	Positive	was
3.	The evolution of a resort's 'social tone'	R	Positive	was
4.	The level of working-class demand	R	Positive	became
5.	this	R	Positive	was affected
6.	the seaside habit	R	Positive/Possible	could develop
7.	This	R	Positive	was
8.	the working-class seaside holiday	R	Positive	was
9.	Cheap and rapid transport	R	Positive/	was
10.	the causal impact of railways, as such	R	Positive	was
11.	They	R	Positive	made
12.	the policies of individual companies	R	Positive/Freq	sometimes favoured
13.	the positive impetus to resort growth and changing demand patterns	R	Positive/Freq	usually came
14.	the railways	R	Positive	responded
15.	they	R	Positive	did...help
16.	They	R	Positive	were
17.	they	R	Positive/Freq	were seldom

Group: HL1
Extract: HL1:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Steady pressure from the labour force	R	Positive	brought
2.	new holidays	R	Positive/Assertive	indeed...were created
3.	Bolton's holiday obserevances	R	Positive	were concentrated
4.	a subsidiary August break	R	Positive	grew
5.	they	R	Positive	lengthened
6.	Burnley	R	Positive	had
7.	Most people in the town	R	Positive	had achieved
8.	the fair holiday	R	Positive	was extended
9.	an additional long week-end in September	R	Positive	had...been secured
10.	The other textile towns	R	Positive	showed
11.	Oldham and Darwen each	R	Positive	acquired
12.	Chorley and Nelson	R	Positive	obtained
13.	Blackburn	R	Positive	followed
14.	only Bolton, which still took several days off at Whitsuntide, and a few of the the smaller towns	R	Positive	had
15.	Lancashire cotton workers	R	Positive	had
16.	their observance of a regular working week for the rest of the time	R	Positive	made

Group: HP1
Extract: HP1:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Developments in the resorts themselves	R	Positive	were
2.	It	R	Positive	was
3.	The policies of landowners	R	Positive	were
4.	Large landowners	R	Positive/Possible	might...subsidise
5.	they	R	Positive/Possible	might step in
6.	Large-scale entertainment	R	Positive/Freq	was rarely
7.	local government	R	Positive	took on
8.	local authorities	R	Positive	were taking over
9.	The leading citizens of succesful seaside resorts	R	Positive/Possible	might like
10.	most such towns	R	Positive	owed
11.	The rising demand for seaside holidays	R	Positive	owed
12.	this	R	Positive	owed

Group: HL1
Extract: HL1:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The evolution of this distinctive Lancashire holiday system	R	Positive	had
2.	The demand for seaside visits	R	Positive	was spread
3.	this accidental stagger effect	R	Positive	made
4.	the working-class season	R	Positive	lasted
5.	even this	R	Positive	was
6.	working-class demand	R	Positive	was channelled
7.	Railways and resorts	R	Positive	were
8.	there	R	Positive	was
9.	August Bank Holiday	R	Positive	was
10.	the longer season	R	Positive	enabled
11.	Rhyl, Douglas, New Brighton and Scarborough	R	Positive	were
12.	the relationship	I	Positive/Possible	can be seen

Group: HP1
Extract: HP1:6

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Seaside resorts	R	Positive	were
2.	they	I	Positive/Necessary	need to be given
3.	I	I	Positive	have tried
4.	the basic pattern of resort development as it remains with us	R	Positive/Degree	was firmly established
5.	[Minor clause: Not that the story should stop at that point.]			
6.	We	I	Positive	need
7.	we	I	Positive	need
8.	The rise of the bungalow, the chalet, the caravan and the holiday camp in the age of the motor car and the charabanc, and the changing experience of seaside England in the age of the package tour and the aeroplane, the holiday flat and the nude bathing beach	I	Positive/Certain	will provide
9.	the seaside resort	R	Positive/Oblig	should be granted

Group: HL1
Extract: HL1:6

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The loss of traditional summer holidays	R	Positive	retarded
2.	much of the southern half of England	R	Positive	was...passing
3.	the really early advances	R	Positive	had come
4.	Their patronage	R	Positive	had stimulated
5.	this	R	Positive	had made
6.	the holiday habit	R	Positive	was encouraged
7.	Cleethorpes, Bridlington and Scarborough	R	Positive	were
8.	the working-class holiday	R	Positive	became
9.	The reasons for this precocious development, and the pattern of change elsewhere	I	Positive/Possible	can be...related
10.	There	I	Positive/Possible	can be

Group: HP2
Extract: HP2:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Charles I	R	Positive	had provoked
2.	the king	R	Positive	accepted
3.	he	R	Positive	recognised
4.	Charles	I	Positive/Logical Necessity	must have been
5.	he	R	Positive	failed
6.	this	R	Positive	undermined
7.	What	R	Positive	went

Group: HL2
Extract: HL2:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The shortness of the sea crossing between Ulster on the one hand and Argyll and the western Lowlands of Scotland on the other	I	Positive/Freq	has always ensured
2.	the Scots, who had come from Ireland and and settled in Argyll	R	Positive	created
3.	they	R	Positive	were
4.	Christianity	R	Positive/Degree	partly came
5.	suspicion of the Scots	R	Positive	grew
6.	Wentworth	R	Positive	obstructed
7.	he	R	Positive/Degree	strongly opposed
8.	Wentworth	R	Positive	denounced
9.	he	R	Positive	had
10.	both Ancrum and Hamilton	R	Positive	were
11.	Hamilton	R	Positive/Assertive	indeed was sent
12.	Sir John Clotworthy, an English planter in in Antrim, whose offer to take over the Londonderry lands Wentworth had preferred to Hamilton's	R	Positive	was...reported
13.	English blood	R	Positive	was

Group: HP2
Extract: HP2:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Charles	R	Positive	was
2.	he	R	Positive	was
3.	he	R	Positive	failed
4.	many	R	Positive	sympathised
5.	[Subject as 4.; omitted]	R	Positive/Degree	shared to some extent
6.	They	R	Positive	disliked
7.	The Scots	R	Positive	were making
8.	to help him defeat them	R	Positive/Hypoth	would make
9.	the king	R	Positive	found
10.	the king	R	Positive	had under-estimated
11.	they	R	Positive	were inspired
12.	Charles's decision to use an English army to restore order	R	Positive	helped
13.	it	R	Positive	persuaded
14.	Charles	R	Positive	finalised
15.	His main army	R	Positive/Hypoth	would cross
16.	A large naval force	R	Positive/Hypoth	would enter
17.	[Subject as 16.; omitted]	R	Positive/Hypoth	[would] land
18.	The royalists of the north-east	R	Positive/Hypoth	would rise
19.	men and weapons	R	Positive/Hypoth	would be sent
20.	an army from Ireland	R	Positive/Hypoth	would cross
21.	[Subject as 20.; omitted]	R	Positive/Hypoth	would threaten
22.	Other forces from Ireland	R	Positive/Hypoth	would land
23.	the Covenanaters	R	Positive/Hypoth	would be forced
24.	[Subject as 23.; omitted]	R	Positive/Hypoth	would...be overwhelmed

Group: HL2
Extract: HL2:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	the national covenant	R	Positive	was drafted
2.	[Subject as 1.; omitted]	R	Positive	[was] signed
3.	effective control of the country	R	Positive	was
4.	Charles I	R	Positive	concluded
5.	Both king and covenanters	R	Positive	began
6.	These events	R	Positive/Predictive	naturally had
7.	The Scots colonists in Ulster, originally seen as bulwarks of English authority in Ireland	R	Positive	became

Group: HP2
Extract: HP2:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The plan	R	Positive	looked
2.	it	R	Positive	was
3.	Attempts to raise the forces necessary for the war	R	Positive	demonstrated
4.	Charles	R	Positive	came
5.	the marquis of Hamilton	R	Positive	sailed

Group: HL2
Extract: HL2:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The trouble with this policy	R	Positive	was
2.	the covenanters	R	Positive	refused
3.	the king	R	Negative	was not
4.	it	R	Positive	was
5.	This	R	Positive	delighted
6.	Bishop Henry Leslie of Down (himself a Scot)	R	Positive	was told
7.	some action	R	Positive	was
8.	Wentworth	R	Positive	wrote
9.	the names of non-conformists	R	Positive	were
10.	action	R	Positive	[was]

Group: HP2
Extract: HP2:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	the Covenanters	R	Positive	sent
2.	There	R	Positive	was
3.	Aberdeen	R	Positive	changed
4.	the 'Trot of Turrif'	R	Positive	saw
5.	the Covenanters	R	Positive	gained
6.	Many	R	Positive	hoped
7.	few	R	Positive	expected
8.	The king	R	Positive	had realised
9.	[Subject as 8.; omitted]	R	Positive	saw
10.	the Covenanters	R	Positive	knew
11.	time	R	Positive	proved
12.	a force	R	Positive	was stationed
13.	the king	R	Positive	had
14.	harsh reality	R	Positive	failed
15.	Open opposition to the war, and to his policies in general	R	Positive	was spreading
16.	the Covenanters	R	Positive	decided
17.	They	R	Negative/Possible	could not keep
18.	they	R	Positive/Volition	would force

Group: HL2
Extract: HL2:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The king's failure to invade Scotland	R	Positive	forced
2.	Neither side	R	Positive	expected
3.	each	R	Positive	agreed
4.	Ireland	R	Positive	continued
5.	Donald Gorm	R	Positive/Presumptive	apparently supplied
6.	Charles	R	Positive	appointed
7.	Antrim	R	Positive	was promised
8.	Donald Gorm of Sleat	R	Positive	was
9.	It	R	Positive/Presumptive	was no doubt intended
10.	the commission	R	Positive	made
11.	Charles	R	Positive/Possible	probably... recognised
12.	[Subject as 11.; omitted]	R	Positive	offered
13.	the treaty of Berwick	R	Positive	was used
14.	The covenanters	R	Positive	decided
15.	it	R	Positive	was being said
16.	Argyll	R	Positive	was assigned
17.	it	R	Positive	was
18.	it	R	Positive	had been decided
19.	Dumbarton Castle	R	Positive	had been handed back

20.	Strafford's idea of landing troops there	R	Positive	had been revived
21.	Strafford's	R	Positive	was ruined
22.	He	R	Positive	had...hoped
23.	it	R	Negative/Degree	was not fully assembled
24.	it	R	Positive	required
25.	The covenanters	I	Positive/Presumptive	appear to have realised
26.	It	I	Positive	is
27.	that Strafford would lead a diversionary raid from Ireland, or would send his army to help the king in England	R	Positive	was
28.	the covenanters	R	Positive	commissioned
29.	Argyll	R	Positive	was instructed
30.	Argyll	R	Positive/Hypoth	would lead
31.	This commission to Argyll	R	Positive/Presumptive/Degree	was undoubtedly partly intended
32.	they	R	Positive	wrote
33.	he	R	Positive/Presumptive/Hypoth	obviously... would inform
34.	those who thought the commission 'may be but a boast to hold the Irish army at home'	R	Positive	were
35.	the covenanters	R	Negative	did not send
36.	their plans to do so if necessary	R	Positive	were
37.	The fact that at this very moment they were successfully invading England	R	Positive	indicated

Group: HP2
Extract: HP2:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The consequences of the Bishops' Wars	R	Positive	were
2.	The Scots	R	Positive	had called
3.	Charles	R	Positive	came
4.	[Subject as 3.; omitted]	R	Positive	acceded
5.	he	R	Positive/Degree	virtually surrendered
6.	The triumph of the Covenanters	R	Positive	seemed
7.	victory	R	Positive	turned
8.	The Bishops' Wars	R	Positive	had destabilised
9.	the oppressed Catholics, inspired by the Covenanters' example	R	Positive	rose
10.	the Scots	R	Positive	sent
11.	England	R	Positive	collapsed
12.	the Scots	R	Positive	felt
13.	It	R	Positive	was
14.	the Covenanters	R	Positive	overstretched
15.	they	R	Positive	infuriated
16.	the great Scots triumph of the Bishops' Wars	R	Positive	was converted
17.	The never-conquered country	R	Positive	was conquered
18.	the consequences of the Covenanters' early triumphs in the Bishops' Wars	I	Positive/Possible	can be seen

Group: HL2
Extract: HL2:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Strafford	R	Positive	had proved
2.	he	R	Positive	had...managed
3.	it	R	Positive	was
4.	Strafford's new Irish army	R	Positive	was transformed
5.	The fact that it was largely Catholic	R	Positive	meant
6.	the need for money to pay it	R	Positive	forced
7.	Discontent with the rule of Charles I	R	Positive	was given
8.	The weakness of the crown, now powerless in Scotland and under attack in the English parliament	R	Positive/Predictive	naturally encouraged
9.	The 'Old English' (descendants of pre-Elizabethan settlers who had remained Catholics) and protestant settlers	R	Positive	combined
10.	Ulster protestant settlers of puritan or presbyterian outlook, mainly Scots	R	Positive	issued
11.	there	R	Positive	were
12.	the native Irish	R	Positive	began
13.	royal power	R	Positive	was collapsing
14.	the bitter hatred of Catholics expressed by the covenanters and the English parliament	R	Positive/Presumptive	seemed to indicate
15.	Strafford	R	Positive	was executed
16.	his new Irish army	R	Positive	was disbanded
17.	It	R	Negative	was not

18.	the king's own incompetent plotting	R	Positive	made
19.	the king	R	Positive	sought
20.	he	R	Positive	granted
21.	[Subject as 20.; omitted]	R	Positive	heaped
22.	he	R	Positive	gained
23.	his plans	R	Positive	were
24.	He	R	Positive	opened
25.	Charles	R	Positive	instructed
26.	the conspirators	R	Positive	made
27.	Charles I	R	Positive/Assertive	Did...really expect
28.	it	I	Positive	is
29.	the Irish plot	I	Negative/Presumptive	does not seem to have been pursued
30.	it	I	Positive/Possible	may be
31.	his rash tampering with an already dangerous situation in Ireland	R	Positive	had
32.	News that Charles was seeking help in Ireland	R	Positive/Predictive	naturally encouraged
33.	it	R	Positive	was
34.	many native Irish leaders	R	Positive	had begun
35.	an armed rising, to take place late in October	R	Positive	was being discussed
36.	they, and the leaders of the Old English	R	Positive	heard
37.	It	R	Positive	seemed
38.	The native Irish	R	Positive/Hypoth	would help
39.	[Subject as 38.; omitted]	R	Positive/Hypoth	[would] be rewarded
40.	[Subject as 39.; omitted]	R	Positive/Hypoth	[would be] protected

41.	the native Irish, 'the fools' as Antrim later called	R	Positive	decided
42.	they	R	Positive	planned
43.	This part of the plot	R	Positive	was betrayed
44.	a simultaneous rising in Ulster	R	Positive	went ahead
45.	Sir Phelim O'Neill	R	Positive	occupied
46.	virtually all Ulster except for the north of counties Down and Londonderry and County Antrim	R	Positive	were
47.	the main threat to Scottish interests in Ireland	R	Positive	came

Group: HP3
Extract: HP3:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The history of crime in the twentieth century	I	Positive/Predictive	is inevitably dominated
2.	the level of crime recorded by the police	R	Positive	grew
3.	the crime level	R	Positive	remained
4.	Recorded crime	R	Positive	increased
5.	The main increases in these early decades	R	Positive	occurred
6.	Drunkenness offences	R	Positive	declined
7.	It all	I	Positive	suggests

Group: HL3
Extract: HL3:1

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	its study	R	Positive/Degree	was relatively neglected
2.	serious and systematic research on crime and criminal justice	I	Positive	has created
3.	historians	I	Positive	have addressed
4.	No single theme	R	Positive/Possible	could... encapsulate
5.	an unresolved, and perhaps unresolvable tension in the use of the records of criminal justice	I	Positive	is
6.	whether the criminal indictments (the formal charges laid against the accused in the county quarter sessions and assizes) should be taken as a measure of the changes which occurred in criminal behaviour over time, or as an indicator of the contours of criminal justice	I	Positive	is
7.	These two approaches	I	Negative	have neither been nor need be
8.	A study of criminal prosecutions	I	Positive	yields
9.	A positivist interpretation of the criminal statistics	I	Positive/Possible	can...be improved
10.	there	I	Positive	has been
11.	historians	I	Positive/Assertive	indeed...have adopted
12.	both approaches	I	Positive	have been used
13.	It	I	Positive	is

Group: HP3
Extract: HP3:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The yearly figure for indictable (or serious crimes recorded by the police in England and Wales	R	Positive	rose
2.	the upward trend of crime	R	Positive	accelerated
3.	the pattern of increase in crime	I	Positive	is shown
4.	A rate of 249 crimes per 100,000 population in 1901	R	Positive	rose
5.	The upward trend	R	Positive	started
6.	[Subject as 5.; omitted]	I	Positive	has continued
7.	Much less academic and press attention	I	Positive/Freq	tends to be given
8.	The annual average number of persons found guilty of non-indictable crime	R	Positive	was
9.	nearly two million persons	R	Positive	were found
10.	another 136,000	R	Positive	were cautioned
11.	Changes	I	Positive	have taken
12.	drunkenness	R	Positive	was
13.	motoring offences	I	Positive	has been

Group: HL3
Extract: HL3:2

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The present wave of interest in historical crime	R	Positive	began
2.	A large proportion of subsequent energies	I	Positive	have...been spent
3.	that the ratio between recorded and actual criminality was either fairly constant or changed in an intelligible manner	I	Positive/Assertive	Of course...is
4.	the criminal patterns	I	Positive	have been traced
5.	All these studies	I	Positive	have examined
6.	Samaha's study of Essex, which restricts itself to serious crime (thereby omitting indictments for misdemeanor although they comprised a signifcant percentage of cases handled at quarter sessions)	I	Positive	points
7.	the overall crime rate	R	Positive	doubled
8.	Cockburn's essay	I	Positive	duplicates
9.	[Subject as 8.; omitted]	I	Positive	draws
10.	Beattie	I	Positive	maintains
11.	the rural parishes of Surrey and the agricultural county of Sussex	R	Positive	experienced
12.	Further research on different counties	I	Positive/Certain	will...fill out

13.	Preliminary soundings	I	Positive	suggest
14.	changes in the administration of justice	R	Positive	were
15.	the historian	I	Positive	has
16.	offences known to the police	I	Positive	are
17.	An overview of the national trends in recorded crime	I	Positive	has documented
18.	A study of London	I	Positive	confirms
19.	[Subject as 18.; omitted]	I	Positive	adds
20.	This form of analysis of the official published data	I	Positive	has been taken
21.	Further advances	I	Positive/Certain	will be based
22.	A computer analysis of some 20,000 committals to trial between 1835 and 1860 in the Black Country	I	Positive	is

Group: HP3
Extract: HP3:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	offences against property, notably theft and handling stolen goods and burglary	I	Positive/Freq	has consistently been
2.	Violent and sexual offences and robbery	I	Positive/Freq	have generally accounted for
3.	This distribution of the main categories of crime	I	Positive	has remained
4.	crimes of violence and the more organised crimes against property (robbery, burglary)	I	Positive	have increased
5.	the most rapid increase in recent decades	I	Positive	has been
6.	The trend in homicides (including murder, manslaughter and infanticide)	I	Positive	has...been
7.	the current average	I	Positive	is
8.	The death penalty	R	Positive	was abolished
9.	the periodic parliamentary attempts to bring it back	I	Positive	have been resisted
10.	the victim	R	Positive	was
11.	[Subject as 10.; omitted]	R	Positive	was
12.	there	R	Positive	were
13.	Recent crime statistics	I	Positive	reveal
14.	There	R	Positive	were
15.	that burglary crimes fell by 4 per cent last year (and by 11 per cent in London)	I	Positive	is

Group: HL3
Extract: HL3:3

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Statistical surveys of the judicial data	I	Positive	have...provided
2.	All the studies	I	Positive	indicate
3.	Cockburn (1977b)	R	Positive	found
4.	eighty per cent of Black Country committals	R	Positive	were
5.	Fatal violence	R	Positive	was
6.	there	R	Positive	was
7.	An analysis of violent offences in the mid-nineteenth century	I	Positive	points
8.	examinations of cases of assault	I	Positive	suggest
9.	The studies	I	Positive	refer
10.	There	I	Positive/Presumptive	seems to be
11.	there	I	Positive	is

Group: HP3
Extract: HP3:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	males	I	Positive	are
2.	the figure	I	Positive	is
3.	Most crimes	I	Positive	are
4.	young offenders aged 10-21	R	Positive	accounted for
5.	the crime rate both for boys aged fourteen an under seventeen and for young adults aged seventeen and under twenty-one	I	Positive	has increased
6.	Other statistics	I	Positive	indicate
7.	Some of the offenders aged seventeen to twenty-one	I	Positive	display
8.	[Subject as 7.; omitted]	I	Positive	do
9.	It	R	Positive/Oblig	should be noted
10.	The police	I	Positive/Presumptive	are obviously arresting
11.	the rise in juvenile crime in the post-war years	I	Positive/Degree	To some degree ...is due
12.	it	I	Positive/Oblig	should...be noted

Group: HL3
Extract: HL3:4

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	the extent to which contemporary portrayals of crime and criminals exaggerate the professionalism of such behaviour and the role of 'sub-cultural' formations	I	Positive	is
2.	Early-modern felons	I	Positive/Freq	were ordinarily
3.	An examination of the court records	I	Positive	has...led
4.	The image of large gangs of professional vagabonds, inhabitants of a distinct sub-culture, participants in organised crime (Pound, 1971)	I	Positive	is replaced
5.	This re-evaluation of the stereotype of the criminal offender	I	Positive	has...been advanced
6.	They	I	Positive	stress
7.	the eighteenth century offender	I	Positive	belongs
8.	a defence of forest rights or an act of popular price-fixing	R	Positive/Possible	could lie
9.	Some types of criminality	R	Positive	were

10	Sodomites in eighteenth century London	R	Positive	constructed
11.	A criminal underworld of master-thieves and receivers	I	Positive/Presumptive	seems to have had
12.	A similar reappraisal	I	Positive	has influenced
13.	Both the range of offences committed by vagrants and the number of professional vagabonds	I	Positive	is being found
14.	The description of a professional 'criminal class' (Tobias, 1967, 1974 and 1979; Chesney 1970)	I	Positive	is being replaced
15.	it	I	Positive	seems
16.	it	I	Positive	is
17.	it	I	Positive	has been suggested

Group: HP3
Extract: HP3:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The upward trend of officially recorded crime	I	Negative	is not
2.	Variations in recorded crime rates	I	Positive/Possible/ Freq	can often reflect
3.	Most crimes which become known to the police	I	Positive	are reported
4.	Victims	I	Negative/Freq	often do not report
5.	F.H. McClintock	R	Positive	argued
6.	The level of official crime	I	Positive/Possible	can...be affected
7.	the American criminologist, Thorsten Sellin	R	Positive	declared
8.	Views	I	Positive	differ
9.	Some	I	Positive	say
10.	others	I	Positive	say

Group: HL3
Extract: HL3:5

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The research undermines	I	Positive	undermines
2.	By no means all crime	R	Positive	was dealt with
3.	Criminal behaviour	R	Positive/Freq	was often dealt with
4.	Cases of poaching, prosecuted under the game laws	R	Positive/Freq	were increasingly
5.	Many moral offences	R	Positive	were dealt with
6.	It	I	Positive	seems
7.	Some offenders	R	Negative	were not brought
8.	A prosecution for witchcraft	R	Positive/Freq	was often
9.	Other types of crime, such as assault and domestic violence	R	Positive/Possible	could...be dealt with
10.	Such limits to the recourse to prosecution	R	Negative	were not... granted
11.	Many of the existing studies	I	Positive	pour
12.	The criminal justice system	I	Negative	does not create
13.	it	I	Positive	processes
14.	It	I	Positive	dips
15.	Such active intervention in the regulation of social conduct	R	Positive	induced
16.	Early-modern fears that hunger bred a temptation to both crime and disorder	I	Positive/Presumptive	seems to have led

17.	The statistical findings in relation to vagrancy	I	Positive	reflect
18.	The local maintenance of base children	R	Positive	encouraged
19.	The peak of crime (especially riot and assault cases) in the 1720s	R	Positive	was
20.	[Subject as 19.; omitted]	I	Positive	records
21.	The increase in sodomy cases at the beginning of the nineteenth century	I	Positive	has been ascribed
22.	The frequency of infanticide between 1840 and 1880	R	Positive	was related
23.	The frequency of theft during the same period	R	Positive/Possible	could be
24.	studies of popular resistance to the 'New Police' of the nineteenth century, of the police crusades against street prostitution, and of the development of notions of juvenile delinquency	I	Positive	illustrate
25.	More long-term and widespread changes in the pattern of crime	R	Positive	could be
26.	the sixteenth and seventeenth centuries	R	Positive/Validative	Broadly speaking witnessed
27.	Samaha's study of Elizabeth Essex (1974)	I	Positive	uncovers
28.	Grand juries	R	Positive	indicted
29.	petty juries	R	Positive	registered
30.	reorganization of the court system and its bureaucracy	R	Positive	ensured
31.	Cockburn (1969, 1975 and 1978)	I	Positive	detects
32.	the judges	I	Positive/Possible/ Assertive	he feels, may have encouraged

33.	the decisions of prosecutors, juries and and judges	R	Positive/Presumptive	were evidently
34.	grand juries	R	Positive	sent
35.	petty juries	R	Positive	acquitted
36.	judges	R	Positive	sentenced
37.	that grand juries in rural areas tended to deliver more 'no bill' verdicts in the light of high food prices (Beattie, 1974)	R	Positive	was
38.	the development of summary hearings either before individual magistrates or at petty sessions	R	Positive	was
39.	Nineteenth century changes in judicial personnel and practice	R	Positive	influenced
40.	A transfer of magisterial authority from the landed to the industrial classes between 1836 and 1860 in the Black Country	R	Positive	led
41.	The expanding police role in the prosecution of crime	R	Positive	might have changed
42.	the Criminal Justice Act of 1855 (empowering the magistrates' courts to deal with many indictable thefts)	R	Positive/Assertive	Without doubt led
43.	historians	I	Positive	have produced
44.	'Crime'	I	Positive/Degree	is in large part
45.	The criminal statistics	I	Positive	disclose
46.	a more searching appraisal of the meaning of criminality, of the function of criminal justice and the role of law in the development of the state	I	Positive	has been

Group: HP3
Extract: HP3:6

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	what about larger social and economic forces	[Minor clause; verbless]		
2.	London and the big provincial cities and towns	R	Positive	accounted for
3.	rates of crime per head	R	Positive	were
4.	Urbanisation	I	Positive	has increased
5.	[Subject as 4.; omitted]	I	Negative/Possible	can hardly account for
6.	a substantial and growing amount of crime	I	Positive	has occurred
7.	Crime	I	Positive/Freq	is often thought
8.	we	I	Negative/Logical Necessity	must...not conclude
9.	Not necessarily	[Minor clause; verbless]		
10.	what counts	I	Positive	is
11.	a sizeable proportion of children and young persons	I	Positive/Freq	have always been found
12.	what of the criminogenic impact of unemployment	[Minor clause; verbless]		
13.	Most criminologists	I	Positive	have regarded
14.	the high levels of unemployment in the 1930s, especially amongst young people between fourteen and eighteen years of age	I	Positive	has been associated
15.	It	I	Positive	remains

Group: HL3
Extract: HL3:6

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The relationship between crime and other variables	I	Positive	has...received
2.	Beattie (1974)	I	Positive	stresses
3.	We	I	Positive	are
4.	The connexion between property offences and prices (or trade cycle)	I	Positive/Degree	has been more fully examined
5.	Samaha (1974) and Cockburn (1977b)	I	Positive	find
6.	These	I	Positive/Necessity	must be seen
7.	both the short-term and long-term trends of prices and indictments (per 100,000 population)	I	Positive	suggest
8.	The situation in urban Surrey	R	Positive	was
9.	The major peaks in indictments	I	Positive	follow
10.	Rising prices	R	Positive/Possible	probably heightened
11.	the crime rate	R	Positive	was affected
12.	the recorded levels of property crime	R	Positive	fluctuated
13.	Offenders	I	Negative/Presumptive	seem not to have been
14.	more	R	Positive	took
15.	poaching	I	Positive/Freq/ Presumptive	seem often to have been born
16.	this relationship	R	Positive	began
17.	Property crime, as well as assaults and and offences involving drunkenness	R	Positive/Freq	were increasingly associated

Group: HP3
Extract: HP3:7

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The attempt to find the cause of crime in subcultural value systems	I	Positive	has ceased
2.	the social and legal processes by which some individuals get 'labelled' as criminal	I	Positive	have come
3.	these sociologists	R	Positive	rejected
4.	They	R	Positive	urged
5.	Their argument	R	Positive	was
6.	criminality	I	Negative	is not
7.	Labelling theory	I	Positive	has...been criticised
8.	It	I	Positive	has...been criticised
9.	This 'new criminology'	I	Positive	favours
10.	It	I	Positive	is
11.	It	I	Positive	is
12.	Criminologists	I	Positive	have...tried
13.	'Biogenic' explanations	I	Positive	have ranged
14.	Such biological factors	I	Positive/Possible	are probably
15.	'Psychogenic' explanations	I	Positive	have
16.	it	I	Positive/Possible	can...result
17.	Delinquency	I	Positive	is
18.	John Bowlby's main hypothesis	R	Positive	was
19.	H.J. Eysenck	R	Positive	brought
20.	criminologists	I	Positive	have put forward
21.	The problem with all these attempts to pinpoint the causes of crime	I	Positive	is

Group: HL3
Extract: HL3:7

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The exploration of this new field of social history	I	Positive	has led
2.	The word 'crime' itself	I	Positive	eludes
3.	the early modern scholar	R	Positive/Oblig	should... include
4.	An answer to such questions	I	Positive	requires
5.	Another vital issue	I	Positive	is
6.	the availability of discretion to police and prosecutors	I	Positive	does... compromise
7.	The published literature	I	Positive	illustrates
8.	historians	I	Positive	have initiated
9.	a majority of early-modern assize indictments	I	Positive	are
10.	Vagrants	R	Positive	were described
11.	The stated domicile of the offender	R	Positive/Freq/ Assertive	was often in fact
12.	Similar doubts	I	Positive	have been cast
13.	The factual reliability of the records	I	Positive/Degree	has...been severely undermined
14.	It	I	Positive	suggests

Group: HP3
Extract: HP3:8

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	The search for predisposing factors in the genesis of delinquent behaviour	I	Positive/Certain	will continue
2.	future research	R	Positive/Oblig	should...go down
3.	More attention	R	Positive/Oblig	should be given
4.	More work	I	Positive	is needed
5.	The search for the effect on delinquency of increases in affluence or of movements in the unemployment level in previous decades	R	Positive/Oblig	should continue
6.	the essentially historical questions posed by the 'new criminologists', including the processes by which criminal laws and policies are enacted, and the contrasts in the criminal codes of different socioeconomic systems	I	Positive/Necessary	must be confronted

Group: HL3
Extract: HL3:8

Clause	Mood	Modulation		
	Subject	Finite	Polarity/Modality	Realisation
1.	Faith in the positivist procedure of quantification	I	Positive/Degree	has been considerably undermined
2.	Many historians	I	Positive	present
3.	it	I	Positive	has become
4.	The alternative historical approach	I	Positive	has been
5.	It	I	Positive	is
6.	Further concrete historical investigation	I	Positive	is...needed
7.	It	R	Positive/Hypoth	would be
8.	it	I	Positive	is
9.	the subject	I	Positive	has developed
10.	Existing studies	I	Positive	are
11.	this situation	I	Positive	has been determined
12.	There	I	Positive	has...been
13.	innumerable research topics	I	Positive	have been neglected
14.	More attention	I	Positive/Necessary	needs to be given
15.	Little	I	Positive	is...known
16.	The efficiency and routinization of the judicial process	R	Positive/Hypoth	would be
17.	more	I	Positive	is needed
18.	the state of the subject	I	Positive/Degree	has developed sufficiently
19.	A comparative approach to the assessment of past patterns of criminality	I	Positive/Certain	will advance
20.	it	I	Positive	is

Appendix G: Subjects From Analogous Popular & Learned Articles

Subjects from Popular Articles (Underlined)

BP3:2
French and his co-workers discovered that wild cats had, indeed, hybridised extensively with domestic cats as they spread from their last stronghold in the western Highlands more than 70 years ago. As wild cats moved into new areas they would have had few opportunities to mate with their own kind and instead would have had resorted to mating with their distant domestic relatives.

Subjects from Learned Articles (Underlined)

BL3:2
There seems to have been a sudden, intensive period of hybridization just prior to the recent wildcats, ie around the 1940s. What are the likely causes of this change? Hybridization may have occurred more frequently for two main reasons. First, although their geographical range was increasing, wildcat numbers were then very low... probably because of high mortality (due to gamekeepers) and the small area of forest (compared to more recent times). Forests provide shelter in winter as well as food (especially rodents). Corbett (1978, 1979) showed that adult wildcats in north-east Scotland are territorial with the territory centred within or adjacent to forest. He also described a positive correlation between wildcat density and area of suitable forest.
Secondly, when wildcat numbers were low, they may have had difficulty finding conspecifics with which to mate but no trouble locating domestic cats, as numbers of feral domestic cats (e.g. from abandoned farms) were then relatively high. Normally, such crossbreeding would be prevented by 'agonistic' behaviour...but the combination of low wildcat numbers and a high density of feral domestic cats may have reduced the effectiveness of these isolating mechanisms, allowing significant hybidization.

Appendix G: (cont.)

Subjects from Popular Articles (Underlined)

Subjects from Learned Articles (Underlined)

CP1:2

Researchers devised programs that did well at individual tasks. Computer played chess at a level close to world class; they rediscovered one of Kepler's laws and Ohm's law. They learnt to re-use successful planning strategies to meet new demands. They could answer questions about the stated implications of stories. Yet something seemed to be missing. The programmed computers lacked the smell of real intelligence.

CL1:2

The power behind our gross symbol processing capacities --the factor (or one factor) which makes us thinkers and eg SHRDLU not -- may well be the subsymbolic, pattern-matching power of something like a PDP mechanism operating within us. There is a strong intuition that manipulating gross symbolic structure models the form of some of our thought but somehow leaves out the content. The intuition is often put by saying that such programs have no understanding of what the symbol manipulations mean.

CP2:4

Of course, a single rigid model does not capture the potential variations in the appearance of many common objects. Many objects have parts that move or bend. In addition, an object may not have exactly the same measurements and shape as any previously encountered, yet we recognise it because it resembles a "generic" class of objects. Some vision systems can manipulate such generic models. As computer vision matures, it will become able to recognise objects by their surface properties, such as colour and texture, in addition to edges. When this occurs, robots will need the more sophisticated modelling techniques of computer graphics to represent these more complex visual properties.

CL2:4

One argument that is sometimes advanced against the use of precise spatial correspondence is that many objects are non-rigid with internal degrees of freedom and variable dimensions. It is also clear that human vision has a remarkable capability for recognizing distorted images and drawings. However, advances will be made on these important problems only by explicitly representing the possible degrees of freedom and distortions that are present in a situation. Our knowledge of the visual appearance of objects includes a large amount of information on internal degrees of freedom in their shape and visual properties. To simply discard all of the available spatial information because some of it is not fully constrained would result in the loss of a large portion of our most useful visual knowledge.

Appendix G: (cont.)

Subjects from Popular Articles (Underlined)

Realising the potential danger in the north-east, the Covenanters sent forces north led by the earl (later Marquis) of Montrose -- a fervent covenanter at this time, though later to become the great royalist champion. There was some confused fighting in the north-east: Aberdeen changed hands several times, and further north on 14 May the 'Trot of Turriff' saw royalists drive Covenanting forces from that town. But the Covenanters finally gained control of the region after the Battle of the Brig o' Dee on 19 June, when Montrose's men stormed across the bridge and occupied Aberdeen -- the day after the king had swallowed his pride and made a compromise peace with the Covenanters at Berwick upon Tweed.
Many hoped the Treaty of Berwick would provide a lasting peace: but few expected it to. The king had realised that he had not gathered sufficient men to invade Scotland with confidence, but saw the treaty as merely a temporary humiliation, necessary to provide him with a breathing space while he prepared for a new military effort in 1640. But in 1640 as in 1639 the Covenanters knew well what the king intended, and again time proved to be on their side, not on his. So they could concentrate their attention on the Borders, a force was stationed in Aberdeen to ensure that there was no further trouble in the north-east ...

Subjects from Learned Articles (Underlined)

The King's failure to invade Scotland forced him to make a peace with the covenanters the treaty of Berwick, signed on 18 June 1639. Neither sideexpected lasting peace to follow; each agreed to the treaty to postpone a conflict until circumstances were more favourable to it, and Ireland continued to play a major part in Charles' plans for the event-ual subjection of Scotland. Donald Gorm (at this time or soon afterwards) was apparently supplied with a ship and arms for 1000 men; and on 5 June (just before the start of negotiations with the covenanters) and 11 June (after negotiations had begun) Charles appointed Gorm and Antrim to be his joint lieutenants and commissioners in the Highlands and Isles, to act against his enemies. In return Antrim was promised Kintyre and Donald Gorm of Sleat was to have Ardnamurchan, Strathswordale in Skye, 'Punard' (evidently Sunart) and the islands of Rhum, Muck and Canna. It was no doubt intended that Antrim would make use of his men in Ireland in attacking the king's enemies in Scotland but the commission made no mention of Ireland; probably Charles recognised that it was hopeless to try to get Wentworth and Antrim to work together, and therefore offered them no help from Dublin.

Appendix H

Table 1: First-person subjects and verbs in the extracts

BP1:1 I rounded I gazed I rolled we floated we encounter We found we know	BL1:1 we hope we take we find
BP1:2 I know	BL1:2 [None]
BP1:3 We can look we gain we can begin	BL1:3 [None]
BP1:4 [None]	BL1:4 Aronson and Harms (1985) have suggested We found
BP1:5 I tied [I] set out I did we find I repeated	BL1:5 Aronson and Harms (1985) demonstrated
BP1:6 [None]	BL1:6 we shall review [we] shall attempt we suspect
BP1:7 [None]	BL1:7 [None]
BP1:8 I compared	BL1:8 We know
BP1:9 [None]	BL1:9 we see We recommend
BP2:1 [None]	BL2:1 [None]
BP2:2 [None]	BL2:2 we make We can view

BP3:3
[None]

BP2:4
[None]

BP2:5
[None]

BP3:1
[None]

BP3:2
[None]

BP3:3
[None]

BP3:4
[None]

CP1:1
We try
We have

CP1:2
We explain
we say
We have

CP1:3
we find
we can say
we build up
I call

CP1:4
we seem to move

BL2:3
we identified

BL2:4
We infer
we minimize
we calculate
we consider

BL2:5
[None]

BL3:1
we aim
We attempt
We assume
we would expect
We concluded

BL3:2
Corbett (1978, 1979) showed
He described

BL3:3
[None]

BL3:4
We suggest

CL1:1
I shall suggest
I suggest
I sketch
[I] report
I propose

CL1:2
I would be
We allow (many of us)
we deny
we should maintain
we should hold
we may...hold

CL1:3
we may conceive

CL1:4
[None]

CP2:1
[None]

CP2:2
we know
We can usually recognise
we know

CP2:3
[None]

CP2:4
[None]

CP2:5
we can expect

CP2:6
[None]

CP3:1
[None]

CP3:2
We can divide

CP3:3
[None]

CP3:4
[None]

CP3:5
We have

HP1:1
[None]

HP1:2
[None]

HP1:3
[None]

HP1:4
[None]

CL2:1
[None]

CL2:2
we examine
we will argue
we have
we do know

CL2:3
[None]

CL2:4
[None]

CL2:5
we can have

CL2:6
[None]

CL3:1
we describe
we received
We begin
we summarise

CL3:2
[None]

CL3:3
[None]

CL3:4
We have implemented
We implement
we need
we transfer
we update

CL3:5
[None]

HL1:1
[None]

HL1:2
we bear

HL1:3
[None]

HL1:4
[None]

HP1:5
[None]

HP1:6
I have tried
We need
we need

HP2:1
[None]

HP2:2
[None]

HP2:3
[None]

HP2:4
[None]

HP2:5
[None]

HP3:1
[None]

HP3:2
[None]

HP3:3
[None]

HP3:4
[None]

HP3:5
[None]

HP3:6
we must...not conclude

HP3:7
[None]

HP3:8
[None]

HL1:5
[None]

HL1:6
[None]

HL2:1
[None]

HL2:2
[None]

HL2:3
[None]

HL2:4
[None]

HL2:5
[None]

HL3:1
[None]

HL3:2
[None]

HL3:3
[None]

HL3:4
[None]

HL3:5
[None]

HL3:6
We are

HL3:7
[None]

HL3:8
[None]

Appendix H

Table 2: Examples of Negative Polarity in the Extracts

BL1:1: Hence, these dense assemblages of ophiuroids are not examples of "explosive opportunism" (sensu Levinton 1970) but rather represent stable populations.

BP1:4: If silt clogs up their tube feet, the brittlestars cannot feed.

BL1:6: It is not unreasonable to imagine that cephalopods were common predators in some ancient ophiuroid-dominated communities, as they are in Sweetings Pond.

*

BL2:4: The mtDNA results cannot tell us exactly when these migrations took place.

*

BP3:1: It is not always easy to tell whether an animal which looks like a Scottish wild cat is tainted with domestic cat blood.

BL3:2: Modern and recent wildcats were not clearly separable from each other but, in the males at least, recent wildcats were always further from old wildcats, and closer to hybrids, than were modern wildcats.

BP3:3: It will probably not be long before we get a ginger tom or a tortoiseshell.

*

CP1:2: Even if it gives an adequate description of behaviour, such talk need not give an accurate account of the computational structure underlying behaviour.

CP1:2: Such achievements are not as intuitively "cognitive" as chess-playing and the like.

CL1:3: Parallelism alone is not enough.

CL1:3: But in fact no special mechanism is required and the hypotheses are not explicitly stored, at least not in any normal sense.

CL1:5: But accepting this, we argued, need not lead us to conclude, along with Pinker and Prince, that any improved model must constitute a mere implementation of classical theory.

*

CP2:2: On the other hand, an object's appearance <u>does not change</u> drastically with every small change in viewpoint.

CL2:2: However, the importance of this constraint for achieving robust recognition <u>can hardly be overstated</u>, and we will argue that it plays a central role in most instances of human visual recognition.

CP2:4: Of course, a single rigid model <u>does not capture</u> the potential variations in the appearance of many common objects.

CP2:4 In addition, an object <u>may not have</u> exactly the the same measurements and shape as any previously encountered, yet we recognise it because it resembles a "generic" class of objects.

CL2:6: These groupings <u>are not used</u> for final identification of objects but rather figure as "trigger features" to reduce the amount of search that would otherwise be required.

*

CP3:1: If it takes one woman nine months to produce a baby, <u>shouldn't</u> nine women <u>be able to do</u> the job in one month? Some tasks <u>cannot be performed</u> more quickly by sharing out the work, as the designers of the new parallel computers are finding.

CP3:4: This sort of calculation <u>is not</u> well suited to the DAP because the amount of calculation to be done can differ widely from point to point.

CL3:5: In any event, in many of the models studied to date, it is the training rather than the recall mode which is most computationally intensive; in such cases, the actual operation of a trained net <u>may not</u> of itself <u>require</u> exceptional computing resources.

*

HP1/HL1: [No negative polarities]

*

HL2:3: In the event the covenanters refused to submit but the king <u>was not</u> ready to invade Scotland.

HP2:4: They <u>could not keep</u> the large army they had raised in the field indefinitely, waiting for a time when it suited the king to invade Scotland.

HL2:4: He had at first hoped to have his new army of 9,000 men at Carrickfergus in May, but in the event it <u>was not</u>

fully assembled until mid-July, and even then it probably still required training.

HL2:4: In the event the covenanters did not send an army to Ireland, but their plans to do so if necessary were no idle boasting, a bluff which could safely have been called.

HL2:5: It was not just the collapse of royal power, and fear of how those who seized power would treat Catholics, which sparked off the Irish rebellion of 1641; the king's own incompetent plotting made a major contribution.

HL2:5: With his conviction of his own skill in producing political miracles it is certainly possible that he did; on the other hand, the Irish plot does not seem to have been pursued by him with any great determination, and it may be that he intended it only as an expedient to fall back on if he failed to secure the help of the covenanters.

*

HL3:1: These two approaches have neither been nor need be mutually exclusive.

HP3:5: The upward trend of officially recorded crime is not necessarily an accurate reflection of the 'real' level of crime or the 'real' rate of its increase.

HP3:5: Victims often do not report offences, however, either because they believe they are trivial (and around one in four burglary victims loses nothing of value) or because they think the police will be unable to make an arrest.

HL3:5: Some offenders, moreover, were not brought into contact with the legal system at all.

HL3:5: Such limits to the recourse to prosecution, however, were not so readily granted to strangers, thereby increasing the likelihood of indictment and conviction for those who were not local residents.

HL3:5: The criminal justice system does not create a mirror image of actual crime; it processes only a selective number of offenders.

HP3:6: Urbanisation, however, has increased little since the 1930s, and, hence, can hardly account for the post-war rise in crime.

HP3:6: But since improvement in living conditions over the century, and increased affluence in the post-war decades have not led to a decline in crime, <u>must</u> we <u>not conclude</u> that poverty does not predispose to crime?

HL3:6: Offenders <u>seem not to have been</u> under any immediate pressure of hunger, but in times of 'distress' (1842, 1848) more took to this form of self-help.

HP3:7: As such, criminality <u>is not</u> an inherent property of an individual, but a property conferred by society.

Appendix I

Problems in the Introductory Sections of Articles

BP1:1

SITUATION — From Chadwick's century-old record and studies by a student in the 1960's we know that this bed of Ophiothrix is no fly-by-night community: it is highly persistent.

PROBLEM — Evidence from fossils suggests that millions of years ago, similar communities were commonplace throughout the oceans of the world.

BL1:1

SITUATION — During the last few years

PROBLEM — much attention has been paid to understanding large-scale shifts in community composition over geological time.

BP2:1

SITUATION — "And Adam called his wife's name Eve; because she was the mother of all living" (Genesis 3, 20). Eve hit the papers in the first week of 1987, following an article in Nature which suggested that a common maternal ancestor of all living humans had lived 200 000 years ago in Africa. "'Super Eve' must have lived in East Africa," said the Daily Telegraph.

PROBLEM — What is the story really about?

SIT/PROB — Studies of evolution have become increasingly powerful and verifiable.

BL2:1

SITUATION — Molecular biology is now a major source of quantitative and objective information about the evolutionary history of the human species. It has provided new insights into our genetic divergence from apes, and into the way in which humans are related to one another genetically.

PROBLEM — Our picture of genetic evolution is clouded, however, because it is based mainly on comparisons of genes in the nucleus. Mutations accumulate slowly in nuclear genes. In addition nuclear genes are inherited from both parents and mix in every generation. This mixing obsures the history of individuals and allows recombination to occur. Recombination makes it hard to trace the history of particular segments

	of DNA unless tightly linked sites within them are considered.
BP3:1 SIT/PROB (1)	Ceaseless persecution and the loss of a suitable habitat nearly saw the extinction of the Scottish wild cat at the turn of the century.
RESPONSE	Only a relaxation in the zeal of gamekeepers and the rapid spread of coniferous plantation after the First World War
RESULTS	have allowed the wild cat to recolonise many of its former haunts in Scotland.
SIT/PROB (2)	But today a more insidious threat may be awaiting the Scottish wild cat. This time the threat comes not from man, but from the feral domestic cat.
BL3:1 SITUATION	Over the past 60 years or so, there has been a considerable recovery in the Scottish wildcat population from its 19th century 'low'... This increase may have been partly due to changes in the availability of habitat and food, but may also have been partly because of crossbreeding between wild and domestic cats, with the hybrids subsequently identified (wrongly) as wildcats.
PROBLEM	There have been several (mainly anecdotal) reports of hybridization both in captivity... and in the wild...but few have been authenticated.
CP1:1 RHETORICAL QUESTION	The Chinese philosopher Seng-Ts'an wrote: "If you work on your mind with your mind, how can you avoid an immense amount of confusion?"
SITUATION	Perhaps, then, that confusion is the inevitable lot of cognitive science.
PROBLEM	Cognitive scientists try to understand the mind -- what it is, how it works, and how we can model it.
RESPONSE/NEG EVALUATION	Perhaps, though, we have relied too much on an intuitive understanding of how the mind works, as if we could turn our eyes inward to discover our own cognitive processes.
SITUATION	Cognitive science is an alliance of disciplines philosophy, psychology and linguistics, to name

a few. But it is centred on the relatively new discipline of Artificial Intelligence.

PROBLEM

With AI, it shares the aim of trying to construct computers and computer programs that do the sort of things that minds do.

CL1:1

SITUATION

PDP (Parallel Distributed Processing, a.k.a. Connectionism) is a hot topic in cognitive science.

PROBLEM

It has vehement supporters (e.g. Smolensky [forthcoming]) and equally vehement detractors (Fodor and Pylyshyn [1988], Pinker and Prince [1988]).

CP2:1

SITUATION

Industrial robots working alongside humans on an assembly line look as if they could perform many of the same tasks as people.

PROBLEM:

In fact, most industrial robots are about as dextrous as a human who is blind and deaf, lacks a sense of touch, and has one hand tied down while working with a pair of chopsticks.

CL2:1

SITUATION

A fundamental capability of human vision is the ability to robustly recognize objects from partial and locally ambiguous data. As with most problems of interest to artificial intelligence, this high level of performance is achieved through the use of large amounts of domain-specific knowledge, in this case regarding visual appearance of objects and their components. Methods are known for representing information regarding visual appearance in a computer with a high degree of fidelity, as has been shown by the success of computer graphics in generating realistic images of natural scenes.

PROBLEM

However, this knowledge itself is of little use without effective methods for applying the constraints implicit in the knowledge during the recognition process.

CP3:1

RHETORICAL QUESTION	If it takes one woman nine months to produce a baby, shouldn't nine women be able to do the job in one month?
SIT/PROB	Some tasks cannot be performed more quickly by sharing out the work, as the designers of the new parallel computers are finding.

CL3:1

SITUATION	In this paper we describe recent work at Edinburgh
PROBLEM	investigating a range of neural network models using existing parallel computing facilities. This work is part of a wider research effort in applications of parallel computing which spans molecular dynamics, phase transitions, and critical phenomena, lattice gauge theories of elementary particle interactions, fluid dynamics, electronic structure circulations, optimisation problems, image enhancement, protein crystallography and protein sequence analysis.

HP1:1

SITUATION	Urban history has been one of the most prominent academic growth areas of the last two decades. So has the overlapping discipline of social history; and if in both cases practitioners and outsiders alike have found it difficult to agree on prescribed boundaries, subject matter, agenda and approaches, this has reflected the diversity fertility and originality of much of the work, rather than any lack of discipline or academic rigour.
PROBLEM	The richness of the sources, and the exciting evidence of growth, change and conflict, have attracted particularly eager attention to the nineteenth century, with its developing controversies about the nature and significance of urban social change -- and continuity -- in relation to urban living standards, culture and politics.

HL1:1

SITUATION	Victorian seaside resorts were among the fastest-growing English towns in a period of rapid urbanization; and by the later nineteenth century those which were expanding most

	spectacularly were also having to come to terms with changing patterns of demand for their services. From the 1870's onwards, rising living standards released a flood of new visitors.
PROBLEM	At first, tradesmen and whitecollar workers predominated, but the skilled worker and his family were strongly in evidence at many resorts stimulating the development of new kinds of retailing and entertainment provision and posing problems of public order and marketing strategy for those in authority.
HP2:1 SITUATION	By 1637
PROBLEM	Charles I had provoked his Scottish subjects into revolt against him through absentee, arbitrary, absolutist and, perhaps worst of all anglicising government.
HL2:1 SITUATION	The shortness of the sea crossing between Ulster on the one hand and Argyll and the western Lowlands of Scotland on the other has always ensured close contacts between the inhabitants of Ireland and Scotland. At the beginning of the sixth centruy the Scots, who had come from Ireland and settled in Argyll, created a new kingdom there, Dalriada; later they were to give Scotland both her ruling dynasty and her name. Christianity partly came to Scotland from Ireland, through the work of Columba (who landed on Iona in 563) and others. ...
SITUATION	Not surprisingly, once resistance to the king in Scotland began
PROBLEM	suspicion of the Scots grew fast in Ireland.
HP3:1 SITUATION	The history of crime in the twentieth century
PROBLEM	is inevitably dominated by the explosion of criminality in the last thirty years. In the first half of the century, the level of crime recorded by the police grew at a much more moderate rate, extending a pattern of slow growth since the 1870's.

HL3:1

SITUATION	Despite the central position which the law occupies in pre- and modern English society
PROBLEM	its study was relatively neglected until recently.

Bibliography

Adams Smith, D.E. (1987) "Variation in Field-Related Genres" ELR Journal Vol 1 pp 10-32

Anderson, J.M. (1971) The Grammar of Case Cambridge: CUP

----- (1987) "Case Grammar and the Localist Hypothesis" In Dirven,R. and Radden, G., eds pp 103-121

Barber, C.L. (1962) "Some Measurable Characteristics of Modern Scientific Prose" Reprinted in Swales, J. ed., (1984) pp 1-16

Baynham, M. (1986) "Talking to Halliday" Language Issues No.1 pp 7-11

Bazerman, C. (1988) Shaping Written Knowledge: The Genre and Activity of The Experimental Article in Science Madison: University of Wisconsin Press

----- (1987) "Codifying the Social Scientific Style: The APA Publication Manual as a Behaviorist Rhetoric" in Nelson J.S., Megill, A. and McCloskey, D.N., eds. pp 125-144

Beaugrande, Robert de, & Dressler, Wolfgang (1981) Introduction to Text Linguistics London and New York: Longman

Benson, J.D. and Greaves, W.S., eds. (1985) Systemic Perspectives on Discourse Vol II Norwood, N.J.: Ablex

Berlin, B. and Kay, P (1969) Basic Color Terms Berkeley: University of California Press

Berry, M. (1975) An Introduction to Systemic Linguistics: 1 Structures and Systems London: Batsford

----- (1977) An Introduction to Systemic Linguistics: 2 Levels and Links London: Batsford

Brazil, D., Coulthard, M., and Johns, C. (1980) Discourse Intonation and Language Teaching Harlow: Longman

Brown, G. and Yule G. (1983) Discourse Analysis Cambridge: CUP

Butler, C. (1985) Systemic Linguistics: Theory & Applications London: Batsford

----- (1989) "Systemic models: unity, diversity and change" Word Vol 40 Nos. 1-2 pp 1-35

----- (1990) "Qualifications in Science: Modal Meanings in Scientific Texts" in Nash, W., ed. pp 137-170

Carter, R. (1987) Vocabulary London: George Allen & Unwin

Chafe, W. (1974) "Language and Consciousness" Language 50:1 pp. 111-133

Channell, J. (1990) "Precise and Vague Quanities in Writing on Economics" in Nash, W. ed. pp 95-117

Comrie, B. (1976) Aspect Cambridge: CUP

Connor Ferris, D. (1983) Understanding Semantics Exeter: Exeter Linguistic Studies

Corbett, J. (forthcoming) "Encoding Nature: Writing Science in English" FEMS Microbiology Letters Vol. 100

Cooper, C.R. and Greenbaum, S. eds (1986) Studying Writing: Linguistic Approaches Beverly Hills: Sage

Couture, B. (1985) "A Systemic Network for Analyzing Writing Quality" in Benson, J.D and Greaves, W.S., eds. pp 67-87

----- ed. (1986) Functional Approaches to Writing London: Pinter

Crismore, A., and Farnsworth, R. (1990) "Metadiscourse in Popular and Professional Science Discourse" in Nash, W. ed. pp 118-135

Crystal, D. and Davy, D. (1969) Investigating English Style Harlow: Longman

Dahl, O. (1987) "Case Grammar and Prototypes" in Dirven, R. and Radden, G. eds (1987a) pp 147-161

Danes, F., ed. (1974) Papers on Functional Sentence Perspective Janua Linguarum Series Minor, 147 Prague: Academia

----- (1987) "On Prague School Functionalism in Linguistics" in Dirven, R. and Fried, V. eds. (1987a) pp 3-37

Davidse, K (1987) "M.A.K. Halliday's Functional Grammar and the Prague School" in Dirven, R. and Fried, V. eds. (1987a) pp 39-79

Davies, F. (1991) "Language varieties, genres and text-types across the curriculum" English Studies 6 pp 17-20

Dik, S. C. (1987) "Some Principles of Functional Grammar" in Dirven, R. and Radden, G. eds (1987a) pp 37-53

Dirven, R. and Fried, V. eds (1987) Functionalism in Linguistics Amsterdam: John Benjamins

Dirven, R. and Radden, G. eds (1987a) Concepts of Case Tubingen: Narr

Ghadessy, M., ed. (1988) Registers of Written English London & New York: Pinter

Golkova, E (1987) "On FSP Functions of the First Syntactic Element in the English Sentence" Brno Studies in English 17 pp. 86-95

Greenbaum, S. (1969) Studies in English Adverbial Usage London: Longman

Halliday, M.A.K. (1971) "Linguistic function and literary style: an inquiry into the language of William Golding's The Inheritors in Chatman, S., ed. Literary Style: A Symposium New York: OUP pp 330-365

----- (1976) "Theme and information in the English Clause" in Kress, G. ed., pp 174-188

----- (1978) Language as a Social Semiotic London: Edward Arnold

----- (1985) An Introduction to Functional Grammar London: Edward Arnold

----- (1987) "Language and the Order of Nature" in Fabb, N., et al eds. The Linguistics of Writing Manchester: MUP pp 135-154

----- (1988) "On the Language of Physical Science" in Ghadessy, M. ed. pp 162-178

----- (1990) "New Ways of Meaning" Paper presented to the Ninth World Congress of Applied Linguistics, 15-19 April

----- and Hasan, R. (1976) Cohesion in English Harlow: Longman

----- and Hasan, R. (1989) Language, context and text: aspects of language in a social-semiotic perspective 2nd edition; Oxford: OUP

Hirtle, W.H. (1975) Time, Aspect and the Verb Quebec: Les Presses de L'Universite Laval

Hoedt, J. et al., eds. (1982) Pragmatics and LSP Copenhagen: Unesco-ALSED

Hoey, M. (1983) On the Surface of Discourse London: George Allen & Unwin

----- (1986) "Overlapping Patterns of Discourse Organization and their Implications for Clause Relational Analysis in Problem-Solution Texts" in Cooper, C.R. and Greenbaum, S. eds. pp187-214

----- (1991) Patterns of Lexis in Texts Oxford: OUP

----- (1987b) Fillmore's Case Grammar: A Reader Heidelberg: Julius Groos Verlag

Dubois, B-L (1982) "The Construction of Noun Phrases in Biomedical Journal Articles" in Hoedt, J., et al., eds. pp 49-67

Dudley-Evans, T, ed. (1987) "Genre Analysis and ESP" ELR Journal Vol. 1 pp 1-9

----- and Henderson, W., eds. (1990) The Language of Economics: The Analysis of Economics Discourse ELT Documents 134: MEP and The British Council

Fillmore, Charles (1968) "The Case for Case" in Bach, E. & Harms, R.T. Universals in Linguistic Theory New York: Holt, Rinehart & Winston pp 1-90

----- (1971) "Verbs of Judging: An Exercise in Semantic Description" in Fillmore, C.J. and Langendoen, D.T. Studies in Linguistic Semantics New York: Holt, Rinehart & Winston; pp 273-289

----- (1977) "Schemata and Prototypes" Lecture published in Dirven, R. and Radden, G. eds. (1987b) pp 99-105

----- (1987) "A Private History of the Concept 'Frame'" in Dirven, R. and Radden, G. eds. (1987a) pp 28-35

Firbas, J. (1987a) "On the Delimitation of the Theme in Functional Sentence Perspective" in Dirven, R. and Fried, V. eds. pp 137-155

----- (1987b) "On Some Basic Issues of the Theory of Functional Sentence Perspective" Brno Studies in English 17 pp 51-59

Fodor, J.D. (1977) Semantics: Theories of Meaning in Generative Grammar Hassocks: Harvester Press

Fowler, R. (1991) Language in the News: Discourse and Ideology in the Press London: Routledge

Francis, G. (1989) "Thematic selection and distribution in written discourse" Word 40:1-2 pp. 201-221

Fries, P.H. (1987) "Patterns of information in initial position in English" Paper presented to the Sixteenth International Systemic Congress, University of Helsinki

----- (1987) "Lexico-grammatical patterns and the interpretation of texts" Unpublished MS : Central Michigan Univ.

Gee, J.P. (1991) "Social Gravity: How Sociohistorical Discourses Shape Language and Practice" Mimeo : University of Southern California, Los Angeles

Huddleston, R.D. (1970) "Some remarks on Case Grammar" Linguistic Inquiry 1 pp. 501-511

----- (1971) The Sentence in Written English Cambridge: CUP

----- (1984) Introduction to the Grammar of English Cambridge: CUP

----- (1988) "Constituency, multi-functionality and grammaticalization in Halliday's Functional Grammar" Journal of Linguistics 24 137-174

Hudson, R. (1986) "Systemic Grammar: Review Article" Linguistics 24 pp 791-815

Hurford, J.R. & Heasley, B. (1983) Semantics: A Coursebook Cambridge: CUP

Jackson, H. (1990) Grammar and Meaning Harlow: Longman

Joos, M. (1964) The English Verb: Form and Meaning Madison: University of Wisconsin Press

Jordan, Michael P. (1984) Rhetoric of Everyday English Texts London: George Allen & Unwin

Kress, G., ed. (1976) Halliday: System and Function in Language Oxford: OUP

----- and Hodge, B. (1981) Language as Ideology London:RKP

Lackstrom, J.E., Selinker, L., and Trimble, L.P. (1972) "Grammar and Technical English" Reprinted in Swales, J., ed. (1985) pp 58-68

Lakoff, G. (1987) Women, Fire and Dangerous Things Chicago: University of Chicago Press

Leech, G.N. & Svartvik, J. (1975) A Communicative Grammar of English London: Longman

----- (1987) Meaning and the English Verb London: Longman

----- (1981) Semantics 2nd edn. Harmondsworth: Penguin

Lemke, J. (1985) "Ideology, Intertextuality and the Notion of Register" in Benson, J.D. and Greaves, W.S., eds. pp 275-294

Lewis, M. (1986) The English Verb Hove: Language Teaching Publications

Lyons, J. (1977) Chomsky 2nd edn. Glasgow: Fontana/Collins

McCawley, J.D. (1975) "Verbs of Bitching" in Hockney, D. et al, eds. Contemporary Research in Philosophical Logic and Semantics Dordrecht-Holland: D. Reidel; pp 313-332

McCoard, R. W. (1978) The English Perfect: Tense-choice and Pragmatic Inferences Amsterdam: North-Holland

McIntosh, A. & Halliday, M.A.K. (1966) Patterns of Language London: Edward Arnold

Mathesius, V. (1975) A Functional Analysis of Present-Day English on a General Linguistic Basis trans. L. Duskova; Paris: Mouton

Megill, A. and McCloskey, D.N. (1987) "The Rhetoric of History" in Nelson, J.S., Megill, A. and McCloskey, D.N., eds. pp 221-238

Morley, G.D. (1985) An Introduction to Systemic Grammar London: Macmillan

Myers, G. (1985a) "The Social Construction of Two Biologists' Proposals" Written Communication 2:3 pp 219-245

Myers, G. (1985b) "Texts as knowledge claims: the social construction of two biologists' articles" Social Studies of Science 15, 593-630

----- (1985c) "The social construction of popular science: the narrative of science and the narrative of nature" Paper presented to the Enlish Language research seminar, University of Birmingham, and the Department of Linguistics, University of Leeds, October 1985

----- (1988) The social construction of science and the teaching of English" in Robinson, P.C., ed. Academic Writing: Process and Product ELT Documents 129, London: Modern English Publications and The British Council pp 143-150

----- (1989) "The Pragmatics of Politeness in Scientific Articles" Applied Linguistics 10:1 pp 1-35

Nash, W., ed. (1990) The Writing Scholar: Studies in Academic Discourse Newbury Park: Sage

Nilsen, Don Lee Fred (1972) Toward a Semantic Specification of Deep Case Janua Linguarum Series Minor, 152, Paris: Mouton & Co.

Nelson, J.S., Megill, A., and McCloskey, D.N., eds., (1987) The Rhetoric of the Human Sciences: Language and Argument in Scholarship and Public Affairs Madison: University of Wisconsin Press

Nwogu, K. & Bloor, T. (1989) "Thematic Progression in Professional and Popular Medical Texts" Paper Presented to the International Systemic Workshop, Helsinki

Palmer, F.R. (1979) Modality and the English Modals London: Longman

----- (1987) The English Verb 2nd edn. London: Longman

Paprotte, W & Sinha, C (1987) "Functional Sentence Perspective in Discourse and Language Acquisition" in Dirven, R. and Fried, V. eds. pp 265-298

Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1972) A Grammar of Contemporary English London: Longman

Quirk, R. & Greenbaum, S. (1973) A University Grammar of English London: Longman

Rosch, E.H. (1973) "On the Internal Structure of Perceptual and Semantic Categories" in Moore, T.E., ed. Cognitive Development and the Acquisition of Language New York: Academic Press; pp 111-143

Simpson, P. (1990) "Modality in Literary-Critical Discourse" in Nash, W., ed. pp 63-94

Smith Jr., E.L. (1985) "Functional Types of Scientific Prose" in Benson, J.D. and Greaves, W.S., eds.

Smith, R. and Frawley, W.J. (1983) "Conjunctive cohesion in four English genres" Text 3:4 pp 347-374

Steele, R. and Threadgold, T., eds (1987) Language Topics: Essays in Honour of Michael Halliday, Vol. 2 Amsterdam/ Philadelphia: John Benjamins

Svoboda, A. (1983) "Thematic Elements" Brno Studies in English 15 pp. 49-83

Swales, J. (1981) Aspects of Article Introductions Aston ESP Research Reports No. 1; Language Studies Unit, University of Aston in Birmingham

----- (1984) "Research into the Structure of Introductions to Journal Articles and its Application to the Teaching of Academic Writing" in Williams, Swales and Kirkman, eds. pp 77-86

-----, ed. (1985) Episodes in ESP Oxford: Pergamon

----- (1990) Genre Analysis: English in academic and research settings Cambridge: CUP

Taglicht, J. (1984) Message and Emphasis English Language Series 15, Harlow: Longman

Tarone, E., et al (1981) "On the Use of the Passive in Two Astrophysics Journal Papers" Reprinted in Swales, J., ed. (1985) pp 188-207

Thibault, P.J. (1987) "An Interview with Michael Halliday" in Steele. R. and Threadgold, T. eds. pp 601-627

Thorne, J. (1988) "The Language of synopses" in Ghadessy, M. ed. pp. 137-144

Trimble, L. (1985) English for Science and Technology: A Discourse Approach Cambridge: CUP

Varantola, K. (1987) "Popularization Strategies and text functional shifts in scientific/technical writing" Unesco-ALSED LSP Newsletter Vol 10, No. 2 pp 33-52

Weil, H. (1887; 1978) The Order of Words in the Ancient Languages, Compared with that of the Modern Languages trans C.W. Super Amsterdam: John Benjamins

Whorf, B.L. (1956) Language, Thought and Reality ed John B Carroll; Massachusetts: MIT Press

Wiggin, B and Bernstein, J. (1979) "Technical Writing in EFL: The Journal Article" RELC Journal Vol. 10, No. 2 67-69

Williams, R., Swales, J. & Kirkman, J., eds. (1984) Common Ground: Shared Interests in ESP and Communication Studies ELT Documents 117; OXford: The British Council and Pergamon

Winter, E.O. (1977) "A Clause-Relational Approach to English Texts" Instructional Science 6 pp 1-92

----- (1982) Towards a Contextual Grammar of English London: George Allen & Unwin

Young, D. (1985) "Some Applications of Systemic Grammar to TEFL or Whatever Became of Register Analysis" in Benson, J.D. and Greaves, W.S., eds.

Young, L. (1990) Language as Behaviour, Language as Code: A Study of Academic English Amsterdam/Philadelphia: John Benjamins