

Gardening in the cool uplands of
New England:
how people shaped the land and
the land shaped the people

Robert Haworth

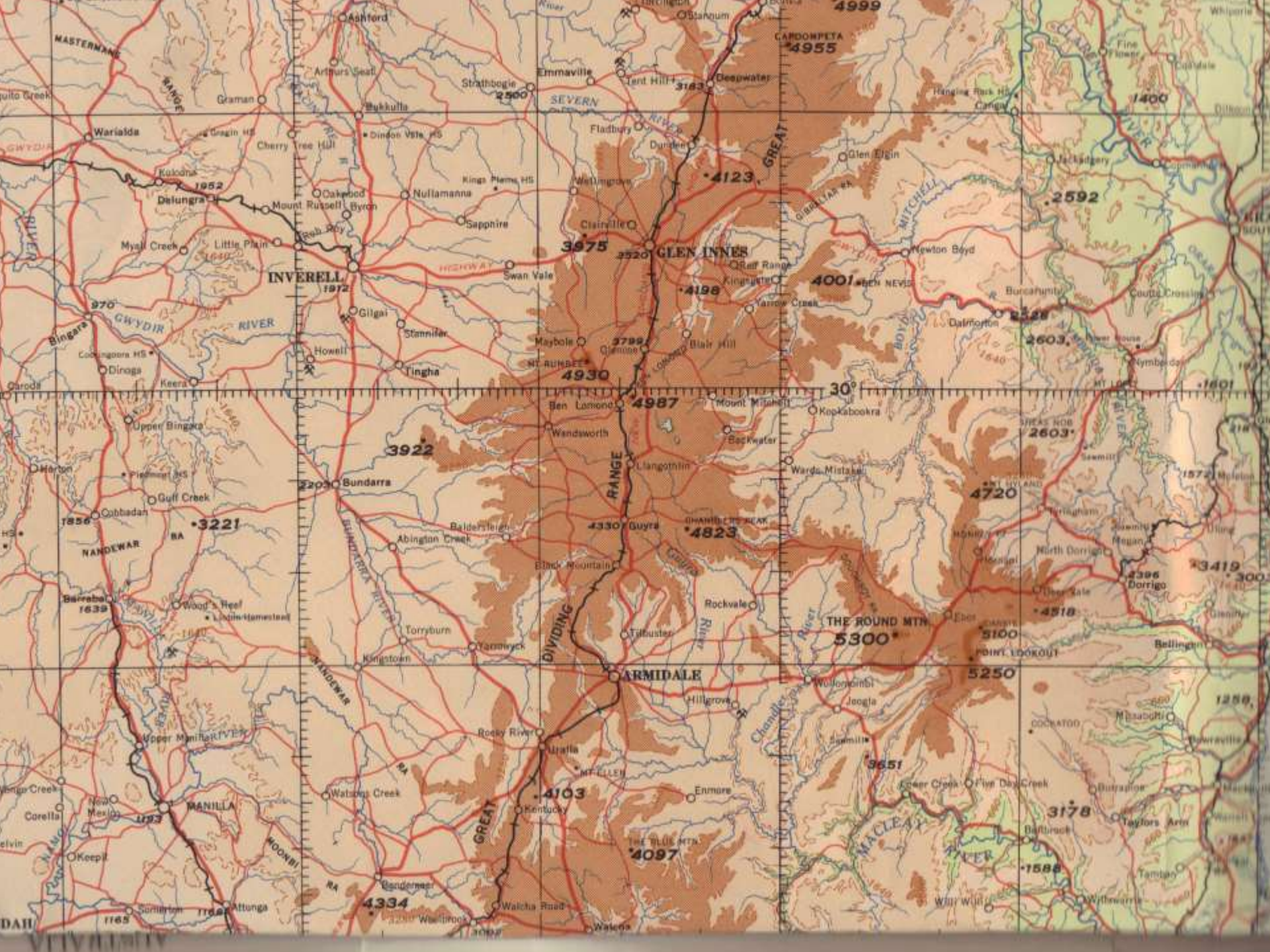
UNE Geography

The Land--

Climate.....

Soils.....

Topography.....



The People—
mostly from the British Isles—pre-
adapted to cooler climates.
Gardening and cottage life
embedded in their culture

Four traditional seasons

- But despite many superficial similarities, four well-defined seasons especially, there are also many significant differences between New England and the homelands of the early settlers and gardeners.

How harsh is the climate for gardening?



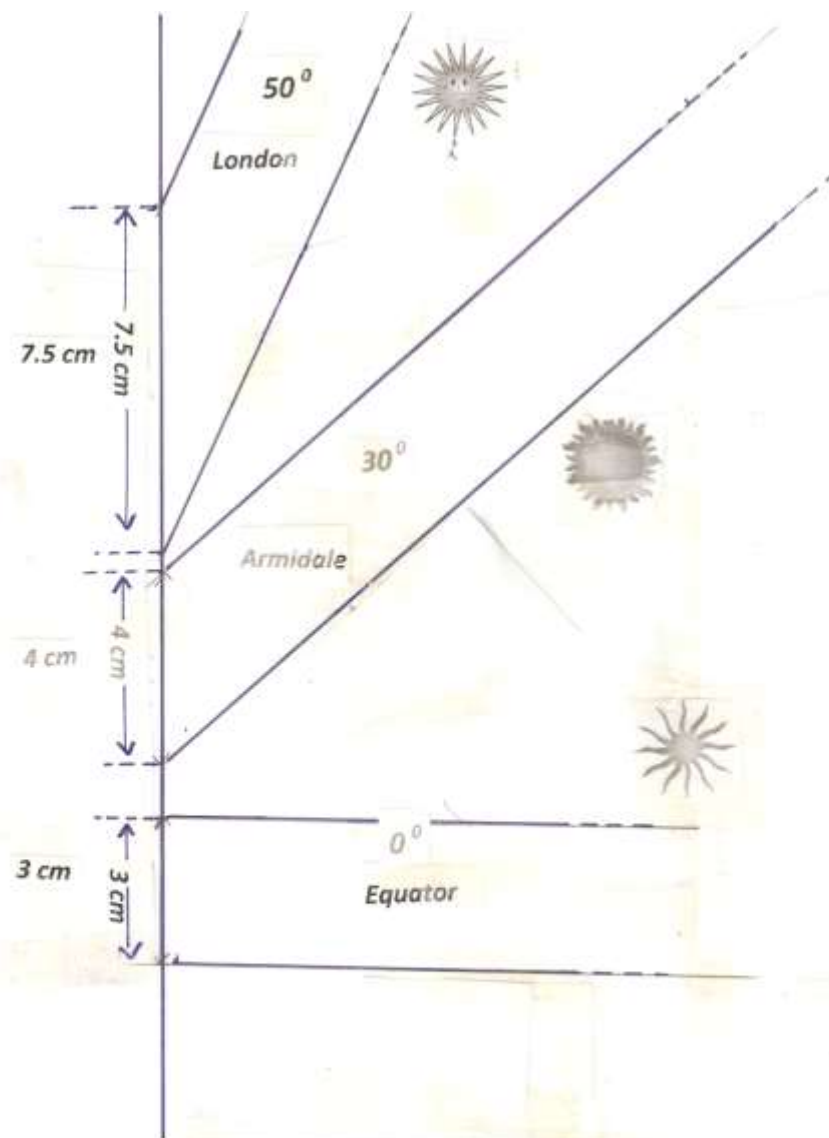
Harsher than southern England—in some respects

- **With dry winters, Armidale's cold is dry, as opposed to the 'wet cold' of most of Britain.**
- **The Armidale region experiences a tablelands climate with cold winters, mild summers and summer dominant rainfall.**

Intense UV solar damage

The sun is more directly overhead at 30 degrees, as opposed to UK's ~50+ degrees

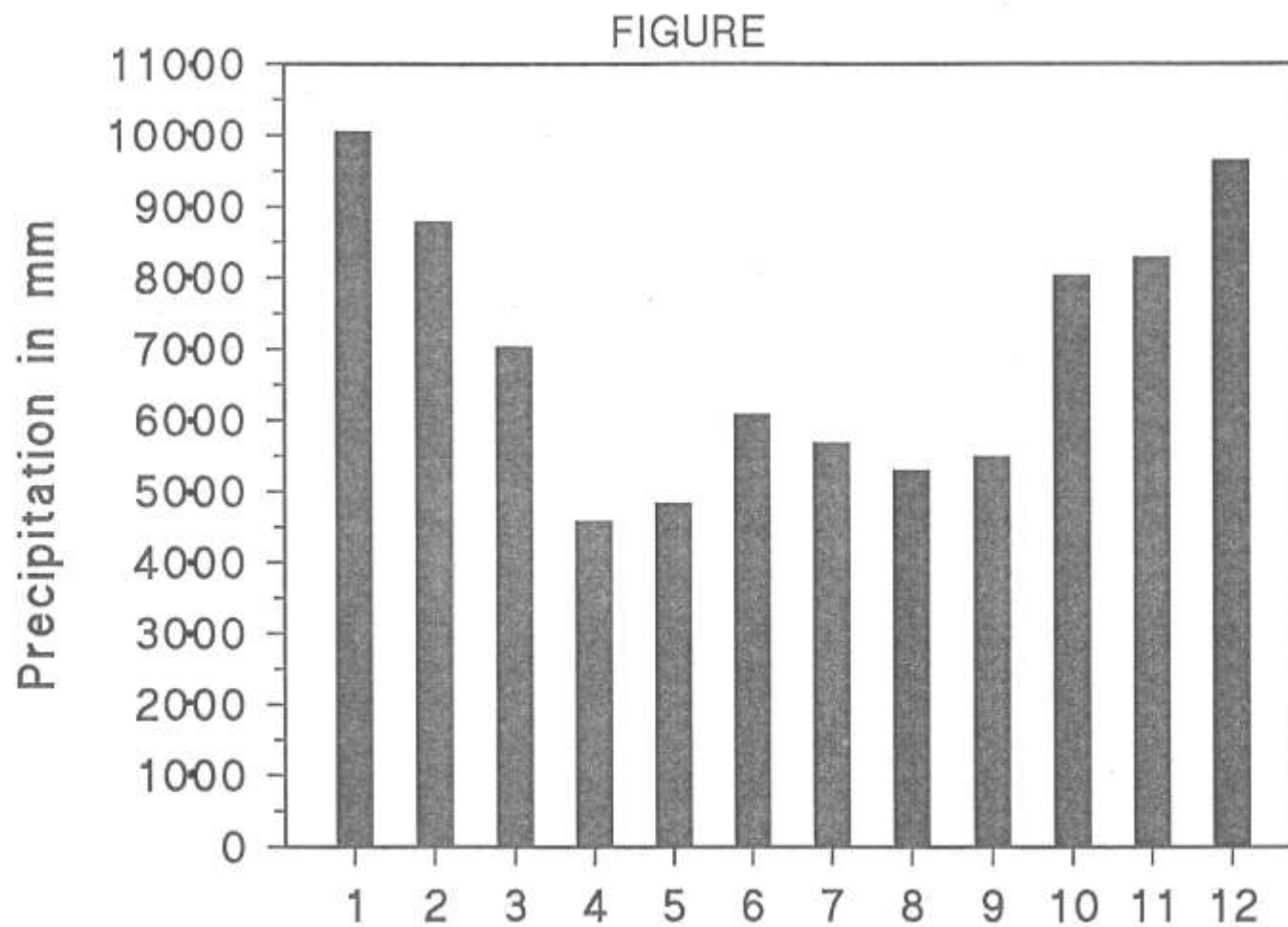
Frost is much more damaging to plants than snow— a blanket of snow can protect young plants. Winter sunshine on frost—at a more vertical angle of 30 degrees --exacerbates frost burn.



Solar radiation arc by latitude

Climate Constraints

- Owing to the 1000 -1500 m altitude winters are severe bringing many frosts (over 70 frosts per winter).
- Frost free period is only 6 months, and snow does not lie long.
- Summers are moderate and rainfall reaches its peak (~ 800 mm /a) but is not quite enough to provide optimum growth.



Total monthly rainfall : 1881--1984

Guyra: 103 year monthly rainfall

How much harsher was the 19th Century?

- The 'Little Ice Age' carried on into the 19th C.
- Both Old England and New England were much colder than the present.
- But 'out of season' cold snaps were (and are) the norm in New England.

Soil Types

- Three major soils in New England, derived from three main rock types:
- 1) **Basalt (volcanic) derived soils**—nutrient rich but forming heavy clays—they need much working and lime addition to lower pH, and much draining to stop waterlogging. They tend to bake hard in hot weather, and can form superficial permafrost in winter.

2) Granite-derived soils

- Light, porous, sandy—easy to dig but water and nutrients are quickly washed away—as is the soil!

3) 'Trap' soils

- Just right! Formed from old meta-sedimentary rocks, the basic country rock, these soils are often mixed with basalt soils washed down from higher up and recent alluvium washed down streams. Reasonably rich, drain well, but hold nutrients.

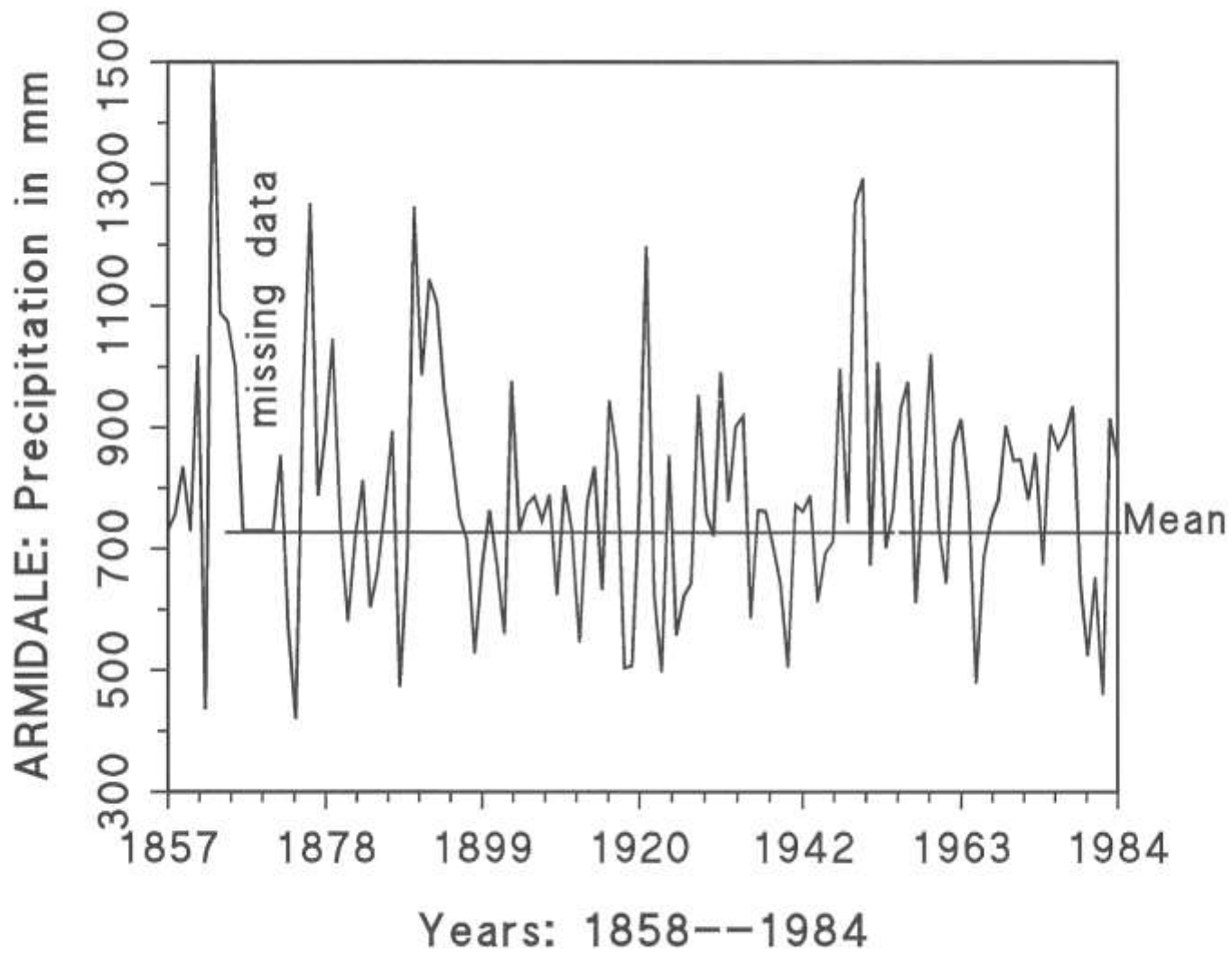
Armidale soils

- Armidale had the good fortune to be set in the valley of the Dumaresq in 'trap' soils, with much alluvium along the creek flats.
- However, all the heights to the south and north are basalt, with heavy cracking clays.
- These guaranteed ground water supplies from wells, and were one reason for founding the town on this site.



ARMIDALE ~ 1870s-summer

- Cottages on 1/2 acre blocks—for garden and horse
- Complete obliteration of native vegetation within town bounds
- Hedgerows and stout fences around gardens
- English Elms around Church and elsewhere
- Dumaresq Creek banks completely cleared



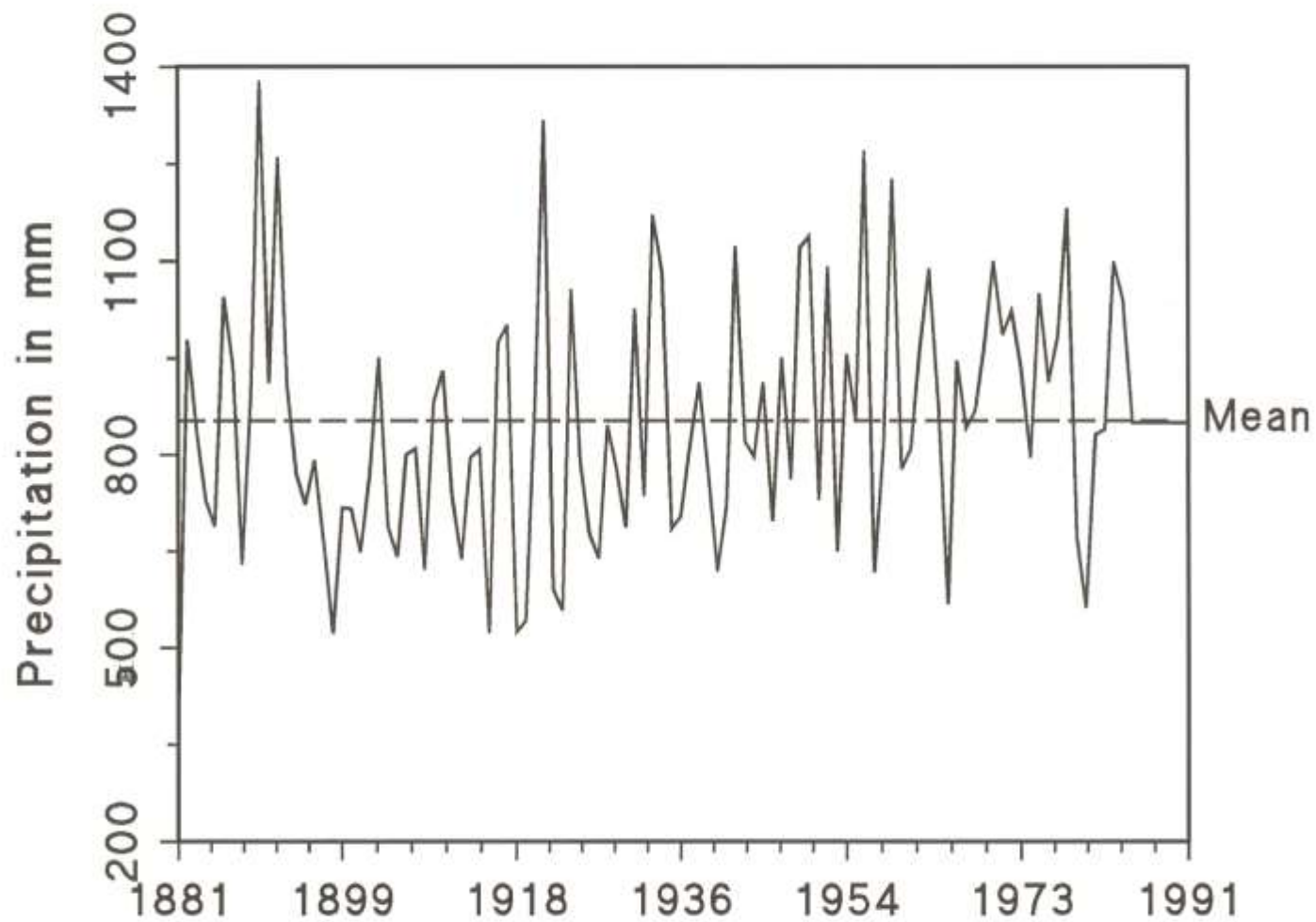


The school garden (Glencoe)

This Edwardian garden is integrated into the school—
note the broad hat brims and loose clothing

The garden is a centre of games and passive recreation
as well as garden work—

and healthy crops despite the ‘Federation drought’ of
1900-----1910.



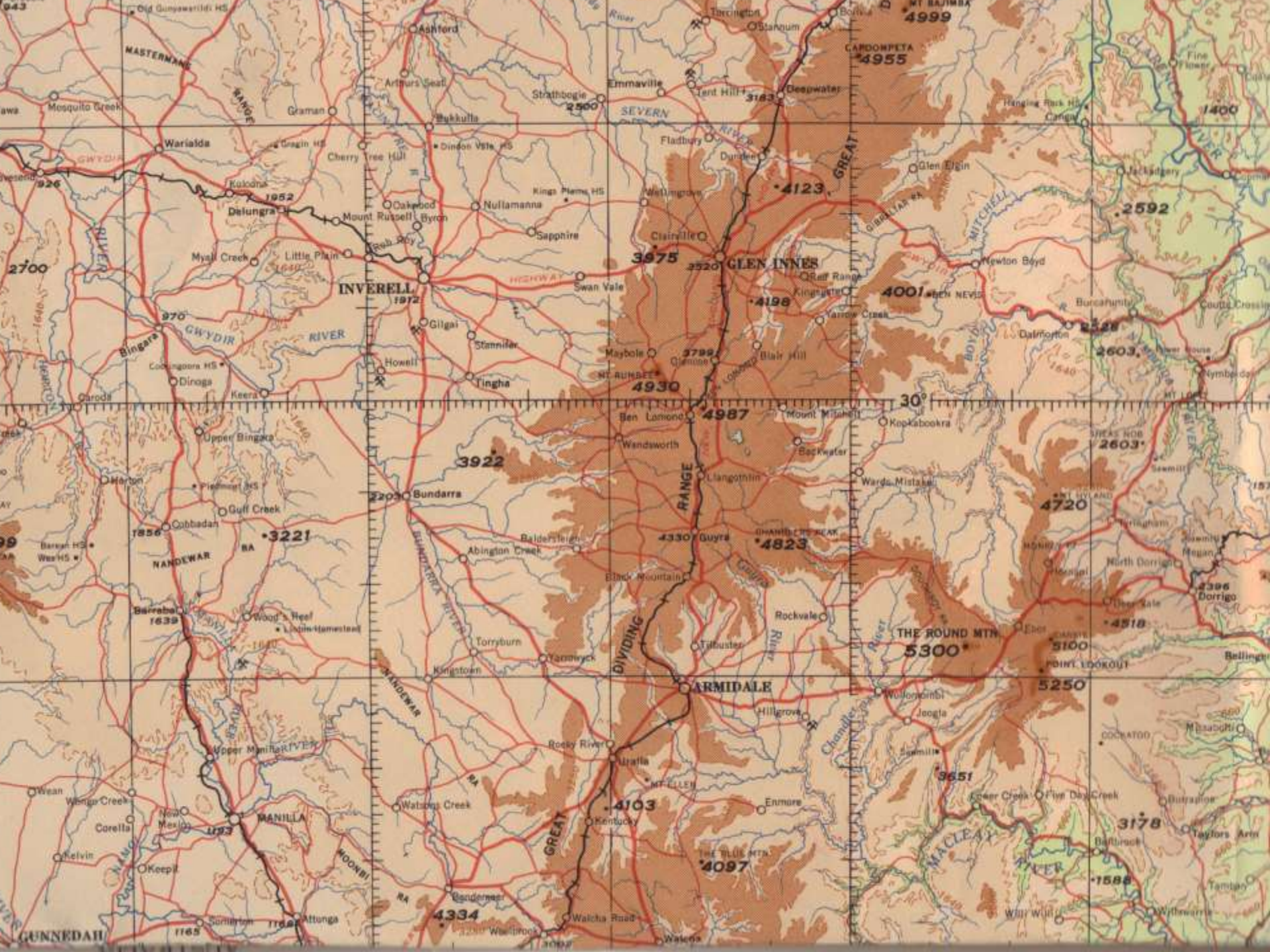
Years: 1881--1991
Glen Innes Annual Rainfall

Gardening structures and aids

- Post and rail fence
 - Hedges
- Continuous casual work force
(teachers, students)
- Broad brimmed hats and loose
clothing to keep off 30 degree
autumn sun

Topography

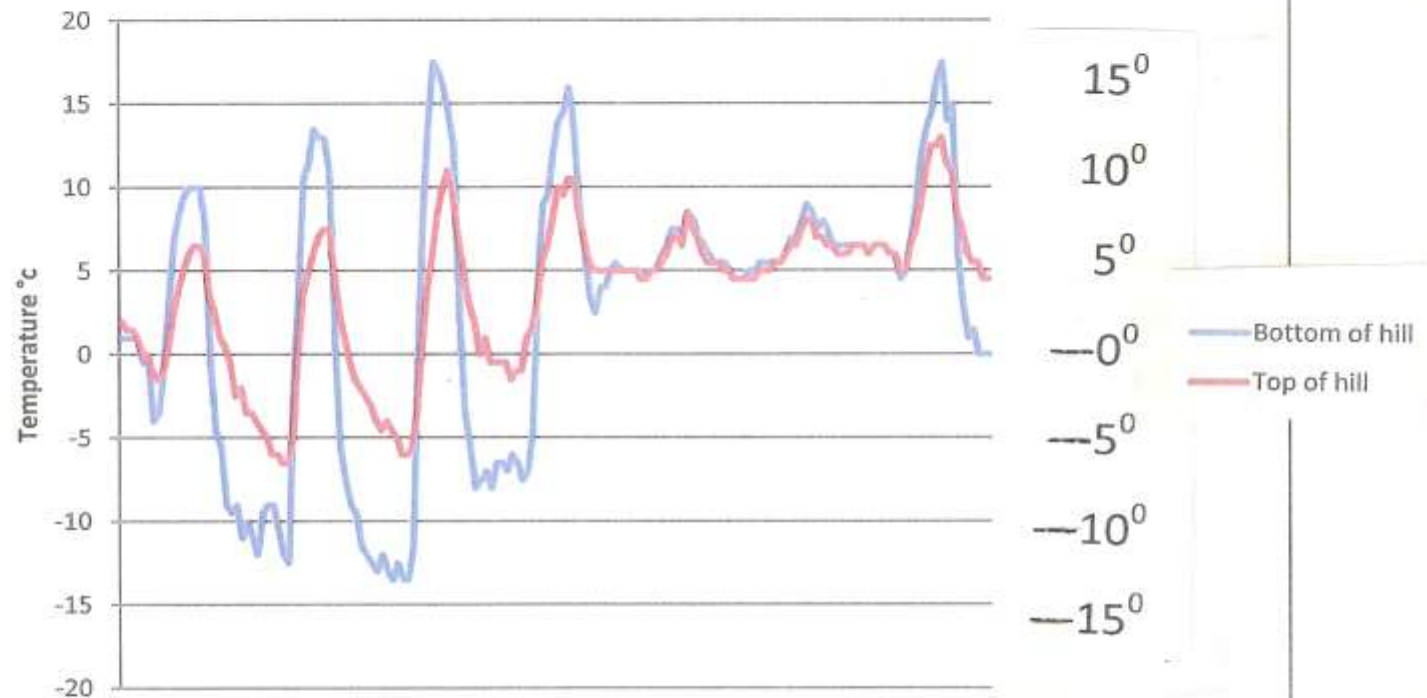
- An “upside down land”---a flattish tableland surrounded by deep gorges.
- But-----plenty of local relief—basalt uplands and volcanic cores at the highest points –with good soils developed in the valleys.
- The Armidale district is in a tectonic basin with higher land to the east, north, south and west



Frost hollows

- Unfortunately, this arrangement encourages cold air drainage. The coldest places are not the tops, but the valley bottoms—where the towns and homesteads are usually located!

Guyra Valley floor profiles for the week of June 23rd to 29th 2012



- Adaptation problems in the NE
climate/ soil/ relief regime

Hail Damage

- Wide temperature range, daily and annually, creates a hail hazard, especially in thunderstorm season—Spring to early Summer, as cool high altitude air meets moist trade winds.
- Gorge and Plateau topography creates thermals –freeze-thaw-freeze conditions in upper atmosphere

Problems to vex the gardener

- Out of season frosts
- Topographic frosts (cold air drainage to valley bottoms)
- Hail with summer thunderstorms
- Long 50 year cycles of alternating drought- or flood-dominated weather patterns
- Soil acidity from too much animal manure—lime source needed

Protective measures against uncertainty

- Hedgerows—at first hawthorn, Monterey cypress and English elm
- Elm also 'sweetened' the soil, ie, raised pH
- An early concentration on stone fruits, needing winter chill---but orchards were blighted by hail and the Queensland fruit fly
- Berry plants most problem free.



Gardening under a different sky

- Despite many superficial and real similarities with British conditions, NE gardeners had to adapt to a climate of greater extremes and uncertainties.
- Science and technology, including breeding new cultivars, new fertilisers, and extensive public works for water storage, etc., helped adaptation.

Origins of gardening

- One curious adaptation was bringing in 'heirloom' species of original (10 000 year old) garden vegetable cultivars to UNE from Iraq and elsewhere in the Middle East.

Gardening began in the Middle East—in mid-latitude uplands

- The New England Tablelands are a near fascimile of the original homeland of cultivation—the upland regions of Turkey and Iran where plant domestication began long ago

Undoing genetic engineering?

- The plants that had been adapted to north west Europe had to be 're-adapted' to climate and conditions remarkably similar to their original provenance.
- Fortunately, many early plant types in Australia were sourced from Dutch South Africa, with 300 years of re-adaptation to similar climates

Return of the natives

- Rose cultivars first grown in the gardens of Isfahan (on the Iranian Plateau) and the dahlias of the northern Mexican Plateau can flourish in the gardens of New England.
- Any number of 'amateur ' breeders can and do support and extend the work of genetic scientists in breeding suitable plant types, both exotic and native.

Multicultural gardening

- A people with a long cultural tradition of both cottage and large scale landscape gardening can adapt that tradition
- Native cultivars have been extensively added to traditional '4 season' plants
- A globalised plant stock makes possible the variety that can be seen in the gardens and parks of Armidale

