

**D 6903(T) Notebook of G. F. Seaman
A geographical study of the Sturt Valley of South Australia**

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[Title page]
G. F. Seaman

THE STURT VALLEY OF SOUTH AUSTRALIA

[Overleaf is a hand drawn two-page map of the Sturt Valley with date stamp] 16 AUG 1928

[Beginning overleaf on RH side page]
Chapter I

Introduction *[Date stamp]* 14 AUG 1928

Nature, when determining the position of the Sturt River Valley, has seemingly played the part of a mathematician. One can almost imagine that the course of the river was determined by the swinging of a mighty compass, which had its point just east of Adelaide. The arc, so described, is almost a semicircle, beginning near Mount Lofty and ending at the coast of St Vincent's Gulf, at Glenelg. The radius of the semicircular river valley is about ten miles while the length of the arc itself is just more than twenty miles.

The area, which includes some fifty square miles of territory, is most interesting to a casual observer or a tourist because of the variety of economic life it presents and its numerous natural beauties. There is a beautiful sea-coast faced by a peaceful ocean, at the mouth of the river, and, as one progresses inland there are to be seen other just as beautiful and interesting sights. From the plains

Introduction (continued)

one may feast his eyes upon the sight of our mountains, a stately background to a pleasing and prosperous plain. These mountains entice one thither, and they contain many sights pleasing to a tourist and even to a casual observer. There is an abundance of natural vegetation on the slopes of the hills, and the scattered orchard and vegetable gardens, with their accompanying home-steads, serve to set off the view with a greater beauty. At National park and Mount Lofty especially, one is thrilled at the sight of steep gorge-like slopes, covered with healthy and stately gum trees. These two places are to South Australia, what the Alpine resorts are to Western Europe, and what the American National Park is to the United States. They are our playgrounds and picnic-places, and the magnets which attract tourists to our State.

The formation of the valley and its environments, is of immense interest to

Introduction (continued)

Geologists because it is so unusual and contains fossils dear to science. Then, too, economically and geographically the Sturt River Valley is both important and interesting. Its industries and its social life demand consideration. So we may see that this important part of our State gives a wide scope for study and consideration from several aspects including geologically, geographically, economically, and socially.

Chapter II

The Structure of the Valley

I The Geological History *[Date stamp]* 5 SEP 1928

The formation of the Sturt River Valley is very complex and unusual owing to its rather peculiar history. The rocks of which it is composed are some of the oldest known to geologists. They are what is known as sedimentary rocks and it was among them that

Professor Sir Edgeworth David found some of the oldest fossils in the world. Despite all this, Geological men tell us that the Mount Lofty Ranges are comparatively new in formation. The Cambrian period, which was one of continuous deposition, was brought to an end by a great movement in the earth's crust. A tremendous pressure became evident and it was so strong as to buckle the strata into folds. The land assumed great ridges and a complexity of relief as a result of this pressure. This folding brought into existence the original mountains of the country but they have long since disappeared. Cycles of erosion wore these folded mountains right

The Structure (continued)

down to a peneplain of low relief.

Near the end of the Palaeozoic era a great ice sheet swept the south of Australia and finished the work of reducing the old mountains to a plain. Also, at this time, the pressure which had caused the folds in the earth's crust, had entirely spent itself and has not since revived. At some time, too, the peneplain was covered by the ocean and during this time. Tertiary must have been extensive. When the seas receded to the south, river systems came into existence, and these were nothing like the present ones because of the great difference in relief. It is supposed by some people that, at that time, the Sturt was a tributary of some large river which had its source near Noarlunga and hence the large sand deposits there. Others, however, do not accept this theory.

In the later Cainozoic [*Cenozoic*] periods the country was again elevated but not this time by a pressure which made the land buckle but by a general upward

The Structure (continued)

movement. The result was that the peneplain became a great plateau and was the beginnings of the present South Australian Highlands. This plateau has been gradually worn down by rain and rivers until it has reached its present form of hills and valleys. It is a significant fact that the most level roads in the Mount Lofty Ranges are those along the ridges. This is because those ridges are the fragments of the surface of the old plateau or uplifted peneplain. All the rest has been excavated and cut down into river gorges and valleys by rain and rivers. This work, though it was performed hundred of thousands of years ago, geologically was performed in a period reckoned as "Recent".

After the peneplain was uplifted and while the work of erosion was proceeding, a condition of tension developed in many parts of the highlands and the result was earth fractures on a large scale. Large portions of the earth's crust

[Following page: Three hand drawn diagrams with heading and captions]

Faulting

A section before faulting occurs

The immediate result of a fault

The form after a period of erosion

The Structure (continued)

faulted, and on collapsing, settled down at divergent angles. This fracturing and subsidence of certain parts (see opposite page) has had a great effect upon the character and position of the Sturt Valley. The uplift and the faulting must have totally destroyed the old river systems and substituted new ones, which are entirely different from those of the old peneplain, in character and in position. The positions of the newly formed rivers were determined by the relief, and by the position and the extent of the faulting.

When the old peneplain was being worn down to its present shape, the rivers which aided so much in that work, transported much soil to lower land and formed a more general slope for the fault scarps. The higher and the lower deltaic plains shown on the map on the opposite page are a result of the deposition of all this alluvial soil, and they constitute the healthy and prosperous Adelaide Plains.

After the uplift and faulting which

[Following page: Hand drawn map with caption]

The Adelaide Plains

between Rivers Torrens and Sturt showing lines of faulting and the resulting platforms.

[Following page: Hand drawn map with heading]

Development of the Old Sturt showing also Brownhill Crk, Torrens, and Port River Estuary

The Structure (continued)

took place throughout this area, the rivers of the Adelaide Plains did not immediately take up the positions they now are in. The coastline, for some time after the faulting, was probably almost straight and there were many short rivers flowing into it. The silt brought down by the rivers pushed the coastline back and back and formed areas much like the "Reed beds" are now. These flat swampy lands considerably checked the streams and caused them to change their lower courses quite often. Gradually the coastline was pushed further out and in some geologically recent time all the rivers flowed into the Port River Estuary. As this course became silted up the Sturt cut through some of its former alluvial deposits and now flows a into the sea via the Patawalonga estuary. The Torrens now flows a into swamps and reed-beds somewhere between the Patawalonga and the Port River estuaries.

The Structure (continued)

II The Source in the "run-off" waters.

The Sturt River has two independent sources. The first, which is the more important in winter, is formed by the accumulation of the "run-off" rain water from the southern side of Mount Lofty and the surrounding slopes. In the rainy season the Sturt receives a considerable stream in this way because of its position and the height of its head-waters. It is these two factors which account for the fact that Crafers, a town near the source, receives the highest rainfall for any town in South Australia. The river receives a much lesser supply of water in this way in the Summer because then there is little rain and much evaporation. The Sturt River, at its source, has the same features as most other rivers as regards the way it collects its waters. Rain falling on mountain or hill slopes naturally tends to run cross-wise to the folds or transversely to the general trend of the mountains. The streams so

The Structure (continued)

formed are called "consequent" streams because they are a the immediate consequence of the tilt of the land. As the uplands weather into ridges and valleys (alternating with the presence of hard and soft rocks) other streams develops which drain the the valleys between the ridges. These are known as subsequent streams because they are developed subsequently to the main stream.

When the river is in a more advanced stage still, these subsequent streams themselves collect smaller streams which flow from either side of their valleys. Those which flow in the same direction as the consequent stream are known as "secondary consequents", while those which flow in an opposite direction are called "obsequent" streams.

Naturally one cannot say definitely just where these small streams are in the head-waters of the Sturt, for, in so small a river, they are existant only when there a is considerable rain and therefore considerable "run-off. Then however, the

[Following page: Hand drawn diagram with heading and caption]

A simple sketch of the Source of a river

c = main consequent stream.

s = subsequent streams.

c¹ = secondary consequent streams.

o = obsequent streams.

NOTE: This diagram is very elementary.

The Structure (continued)

whole "tree" of the river is present and hundreds of rivulets run from every valley and rift between the slopes.

III The Second Source – The Springs.

Near Upper Sturt, on the property of Mr Shield, there are a number of springs. The largest one, ~~which is~~ the "snap" of which appears on the next page, has a daily flow of 666,000 gallons, while \from/ the next largest there flows 125,000 gallons every twenty-four hours. Also, on this and on neighboring properties, there are a number of smaller springs, and the total daily flow of all of them, including the two large ones, is over a million gallons, and practically all of it either flows into the river directly, or reaches it as ground-water. Thus we may see that the river is handsomely supplemented here throughout

[Following page: Black and white photograph with caption and text]

[Date stamp] 18 AUG 1928

The Spring in Mr Shield's Orchard.

The channel which runs to the back of the "snap" conducts the water to the River Sturt a chain distant, while the one in the foreground is used when the owner wishes to irrigate his land. Through \it/ water may be conducted all over the property.

The Structure (continued)

the year. Though in summer some of the water is used on the orchard, and though there is considerable evaporation, the amount of water which flows into the river is not seriously diminished. That water which soaks into the soil, naturally or because of the irrigation, probably finds its way to the river nearby by means of an ordinary "valley" spring. This soakage and other soakages along the valley form the ground water which contributes so largely to the flow of the river. ~~More of.~~ This ground-water will be considered in greater detail in a later chapter.

The springs at Upper Sturt are probably a result of a fault in the earth's crust at that place. There was probably, before the faulting occurred an \unbroken/ layer of impervious rock above which the water flowed, for the rock formed a river bed. Then, when the fault occurred, the flow of this subterranean river was checked by another slab of impervious rock. The stream was hence forced up through a

The Structure (continued)

rift or fissure caused by the fault, and above ground. A fact which goes far in proving that the springs are due to a fault, is that they are all in an approximately straight line. This is characteristic of a such a kind of spring. Also since the water flows from the springs in a constant stream we cannot accept the theory that they are ordinary valley springs. No geologists are sure where the water supply really originates though several theories have been advanced, the most feasible of which is that ~~the~~ it comes from artesian water from the Victorian highlands. It is generally agreed that the water is artesian.

[Following page: Two diagrams with captions]

A Fault Spring.

This may also be a spring originating in local soakage. Water make soak in at “a” and cause at spring through the fault rift.

A Valley Spring

a = is the intake bed where soakage occurs

[Following page: Diagram with heading and caption]

A section of the Sturt Valley showing platforms

A = Young Valley.

B = Mature Valley.

C = Old Valley.

The Structure (continued)

IV Present Form and Relief of the Valley

The present form of the Sturt River Valley is most unusual owing to the faults which have occurred in that region. They have caused the area to have assumed its relief in the nature of platforms and sharp descents from platform to platform. These sharp descents have been considerably alleviated by erosion but are still very marked.

The source of the river is on the highest platform, which originally was part of the large elevated peneplain, the origin of which has been explained at the beginning of this chapter. Thus the river does not begin in a “young” valley but in a “mature” one. From the source to Upper Sturt this form continues but just lower than that town the river reaches the first great escarpment, which marks the end of the first platform. Here is where the first fault occurs. There has been a fracturing of the earth’s crust and while part of the peneplain has

[Following page: Hand drawn map with heading]

The Sturt Valley in Contour

The Structure (continued)

remained steady, part (the western and south-western portion) has subsided.

So from Upper Sturt the river enters a region which has a far greater gradient than previously—it flows down the escarpment, like a torrent, in a “young” valley. The river continues in this manner until it is about a mile above Coromandel Valley when the slope becomes decidedly lessened. This marks the end of the ‘scarp caused by the fault, and the river flows upon the subsided platform and reassumes the characteristics of a “mature” valley river. The fall of the river between Upper Sturt and Coromandel Valley is over 500 feet, and as this is but a distance of 3 ½ miles, the gradient is 140 feet per mile or one foot in every thirty-eight.

The Coromandel Valley area is really part of the Upper Sturt and Stirling platform which has subsided. The gradient here, too, is gradual, as in the higher platform and many of the physical features correspond.

The Structure (continued)

The river only flows a short distance on this platform (¾ miles), when it reaches the second escarpment. This is the side of the second fracture which caused the Adelaide Plains to break off from the Coromandel Valley plateau, and to subside to something like its present position. This ‘scarp is very steep and the fall of the river for some four miles is 600–700 feet—a fall of one foot in thirty.

The river, when flowing down this sharp incline, again becomes a “young” river, and flows in a gorge, called the Sturt Gorge. Here the descent is even steeper than it is down the first escarpment and the gorge-like features are even more pronounced. From the end of the gorge, the slope of the descent becomes more gradual, as it merges into the Adelaide

Plains. Four miles from where it flowed over the edge of the Coromandel Valley platform, the Sturt again has become a “mature” river and is flowing with a

The Structure (continued)

gradual slope again.

The fall of the river then becomes less and less, and the flow of the river slower and slower until at Marion the Sturt assumes many of the characteristics of an “old” valley river, and flows sluggishly, meandering seaward. From Sturt which has a height of about 150 feet above sea-level, the river flows for nine miles to the mouth; the average slope for that distance is a fall of one foot in over three hundred. Compare this with the fall in the gorge— one foot in thirty feet, which has ten times the slope.

Now we may find it convenient to consider the exact forms and the meanings of the terms “young river valley”, “mature river valley” and “old river valley”.

Although it does not occur first in the valley we have in consideration we will find it convenient to consider firstly the “young” river valley, because geologically it is the newest and youngest.

[Following page: Two diagrams with captions]

Diagram of a young river valley. This also shows the various terraces which have been formed as the River cut out its gorge. The oldest are at the top.

Longitudinal section of the bed of a young river, showing the unequal grade, the hard rocks causing waterfalls, and behind which are quiet pools of water.

[Inserted between these pages is a separate folded sheet of paper with ink and penciled handwritten notes, which reads as follows]

Elsie
Miss Bullock
Margaret
Marion Recruitment of Tchrs. }
Cis Govt Respons. }
[?] Ed. v Int. understanding }
Tom . Ives.

I do not suppose that we in S.A. are ~~a~~, worse off than any of the other States. Nevertheless the situation ~~is~~ there is entirely bad.

After much \expensive/ advertising of a very specialized one yr. course for recruits over 25 yrs. We will have about 20 ~~teachers~~ \applicants/—possibly less as the training proceeds. And after much ~~advertising~~ \recruiting/ in U.K. we have 200 people coming from there—20 this month.

But what are 220 teachers when there is a startling \immediate/ need for 800 or 900? And \many/ more & more as the years go on?

~~in the Leaving age is~~ \eventually/ raised for the raising of the Leaving Age has already been indefinitely \postponed because of this shortage/ [therefore] anything that the Gv. can do is surely to the good.

But with Gv. Aid we do not want regimentation & control. These ~~things~~ \evils/ must be avoided at all costs for there cannot be one single pattern where there is such diversity of talent in our boys and girls & besides our nation needs diversity: only with the full development of this divers talent will we produce the great & capable race that is necessary to deal with the complexities of living today—both ~~here among ourselves~~ \in our own land/ & in relation with the other nations of the world [therefore] though we desire Gv. Assist. for recruitment \& training spec./ of teachers we must be alert to see that we do not get evils \that may be/ attendant upon such help.

[Verso of separate inserted sheet reads as follows]

Films

1. Work done in SA

- | | | |
|-------------------------------------|---|--|
| 1. Over air – A.B.C. & Horror Films | } | |
| 2. Outlaw & Dep. – | } | \Such/ Pictures <u>nullify</u> about $\frac{2}{3}$ of our Ed. System |
| 3. Reports – & Recs. | } | |

2. Recommendations –

3. Opportunities to produce.

Result of Q. & new Q – outstanding & clearcut opinions & tastes –
Bush Xmas Basis to work upon
Overlanders

4. Heaps of stuff to work up.

Keep it purely Austr. in character & atmosphere
Romance of pioneers in each state – with trials & tribulations

[End of separate inserted sheet]

The Structure (continued)

The river grade is the most important indication of the age of the river, and hence a valley where the grade is steep has a “young” river running through it The young river valleys have steep, gorgetie like sides which together form a large “V”. The flow of the river is rapid and there may be here and there, waterfalls. When we say the flow is rapid we mean that, taken as a whole, there is a great velocity. However, in gorge areas, there are portions where the flow is comparatively sluggish. This is because of the alternating softness and hardness of the river bed. At one place there may be a strata of hard rock which the river is very slow to erode. The flow here would be checked if the slope of such strata is less than the general gradient of the river. They may also cause pools, ~~out~~ into which and out of which the water flows, but which is itself comparatively still.

Young rivers never deposit sediment permanently, for the load which may be

[Photograph with date stamp] 1 JUN 1928 [and caption]

A part of the Sturt Gorge

Note the rocky bed of the river and also the rocky slopes.

The Structure (continued)

deposited in one flood is washed away in the next. Because of the rapidity of the stream it is capable of carrying considerable sediment and causes much erosion of its beds All loose soil between the rocks and boulders is washed away, both in the bed by the river, and on the slopes by rain. This explains why the bed of a young river contains, often, numerous large and loose—boulders which hamper the progress of the stream and resist erosion. It also explains the absence of soil cover in a young river valley. All this is very well illustrated in the “snap” on the opposite page

[Following page: Two diagrams with captions]

Diagram of a Mature River Valley

The lower slopes of the valley are often in the formed of more or less well defined terraces, which show the development of the valley.

How an Alluvial Fan is formed.

The Structure (continued)

The mature valley areas, as previously mentioned, are those areas between the source and Upper Sturt on the Upper Sturt platform, on the Coromandel Valley shelf, and between the Gorge and the Adelaide plains in the district named Sturt. In these parts the bed of the river has a gradual slope, and the sides of the valley, though they are definitely sloping are not steep. The course is well-defined and the river has a steady even flow, and it is not hampered by boulders or by old rock bars. There is, in a mature river valley, a continual transportation and deposition of silt. This is of course perhaps, the most important feature of a mature river valley.

When the river emerges from the steeper regions to those of lower gradient, there is formed an alluvial fan. These occur at Coromandel Valley and to a greater extent at Sturt. There is also an alluvial fan where the tributary from near Cherry Gardens enters the Sturt south of Coromandel Valley. They are caused by a

[Following page: Two diagrams with captions]

Haughs

a = where the river cuts into its bank

b = where the sediment is deposited to form an "haugh"

A – B Cross-section below.

Cross Section of A – B on above Diagram

The Structure (continued)

sudden lessening of slope. This causes the stream to widen and to lose velocity. Hence the transporting power of the stream is considerably lessened and most of its load is deposited at the mouth of the gorge or at the join of a tributary, as the case may be.

Another form of deposition in the mature valleys is that of "haughs". In such a valley the river does not flow cover all the bed but flows from side to side in a meandering fashion. That is to say, the valley becomes a series of curves, and the river deposits sediment on the inside part of the curve where the current is naturally the weakest. These deposits are known as "haughs". These haughs are continually and very gradually changing their position, as the river itself cuts itself differing channels in the bottom of the valley.

[Following page: Photograph with caption]

[Date stamp] 18 AUG 1928

A cultivated "haugh" on the property of Mr Shield at Upper Sturt. The Sturt River curves round in the background.

The Structure (continued)

River Terraces are formed when a river valley widens out and continues to erode its bed, leaving shelves of alluvium, at various levels according to the age and width of the valley. These occur at several places of the Sturt River Valley. Slight changes in elevation of the land also cause such terraces to be formed.

[Following page: Photograph with caption]

[Date stamp] 18 AUG 1928

A portion of the National Park Oval showing the channel to which the Minnow Creek is confined, running along at the foot of the hills.

The Structure (continued)

The form of National Park and Long Gully recreation areas are worth consideration. Originally the Minnow Creek, a tributary of the Sturt, flowed from side to side with numerous "haughs" on the concave sides of its curves. Now, however, a channel has been formed for it

artificially, along the edge of the bottom of its very large valley, and to it the creek has been confined. This secure a large flat recreation ground for picnic parties.

The Sturt flows in an old river valley from Marion to the mouth at St. Leonards. This old valley is really no valley at all. The river flows through very gently sloping plain land in a course which it has cut just below the level of the land itself. The fall of the river is almost imperceptible as it falls only 70 feet from Oakland to St Leonards, which is a distance of over three miles. The course of the river is everchanging and meandering It is not all well-defined. This is because of the continued deposition of silt and because

[Following page: Two diagrams with captions]

A cross-section of an "old" river valley.

The meandering course of the Sturt River just West of the Willunga Railway line, a mile to the north of Ascot Park.

The Structure (continued)

of the small gradient. Also because the fall of the river is so little the velocity of the river is also very slow, and its erosive and transporting\power/ is the minimum. However there is continually flowing from the foothills, a large amount of silt which is deposited along the banks and in the bed of the "old" river. Hence the bed of the river is always being filled up and the river is continually being turned from one bed to another. The meandering of the river is, in some part, ~~formed~~ \caused/ in this way. Also we find that it is always tending to cut into one bank and to fill up it bed with sediment on the other side.

All this meandering and changing of the course of the river has caused the building up of a large flood plain for some distance on either side of its present course. The Adelaide Plains, in this district have been covered with many feet of rich alluvial soil, by the Sturt river. This ground, on either side of the Sturt

[Following page: Photograph with caption]

[Date stamp] 15 AUG 1928

The Grandstand at the Morphettville racecourse showing part of the course in the foreground.

The Structure (continued)

is thus very flat, and so the flooding in the wet season covers many acres especially near the mouth. The very flatness of the ground, however, is, in many other ways, a boon to man both in industry and in recreation. The Morphettville race course, one of the best in South Australia is situated a mile or so east of Glenelg, and just alongside the river Sturt.

As the river nears its mouth the characteristics of its old river valley become more marked and accentuated, until, near St Leonard's, it almost loses itself in swamp. The river, by means of this swamp, reaches, the Patawalonga Creek which is an estuary of the sea. The join of the Sturt to the so called "Pat", ~~how~~ is by no means defined and fixed, especially in winter time, or when the tide is in. The Patawalonga itself, has a very ill-defined course and, as it is effected by the tide it aids the Sturt in converting much land into useless and salty marshes. The only use which

[Following page: Photograph with caption]

[Date stamp] 15 AUG 1928

The Sturt River at Glenelg a short distance from its confluence with the Patawalonga. Note the low shrubs characteristic of such an area. This "snap" was taken at low tide.

The Structure (continued)

this land can be put to, is the pasturing of cattle, for no crop can grow on such salty soil, but some rough bushes and grasses do grow there.

All of these conditions, it is obvious, will become more and more extensive as time passes, unless there is some disturbance, such as the tilting of the land, takes place. The land will become flatter and flatter, as more silt is brought down, the flow of the river slower and slower, and the course of the river will become more and more ill-defined. The swamp and marsh lands around the Patawalonga, will, as time passes, extend further and further inland.

[Following page: Diagram with caption]

Illustration of how the wind forms the sand-dunes in ridges— three in the case under consideration.

The Structure (continued)

∨ The Sand Dunes.

All along the coastline of the Sturt River valley, there is an almost continuous ridge of sand-dunes. Apart from the break where the Patawalonga enters the sea at Glenelg, these dunes are remarkably regular and even—about ten chains in width and averaging from 30 to 40 feet high. Where the dunes have not been interfered with, they usually show three more-or-less well defined ridges. Under the influence of the prevailing south and south-west winds and associated currents, this long sand spit has been slowly built up from Sea-cliff northward. The building of this dune barrier was one of the most important factors in the growth and development of the lower Adelaide plains.

The sand dune belt has greatly influenced settlement as may be noted from the long line of sea-side suburbs. This line of hills bid fair to cause the development of a continuous line of residential suburbs and sea-side resorts.

[Hand drawn map with heading]

Map of the Coast showing position of Sand Dunes

The Structure (concluded)

There are wide, flat, excellent beaches, and are greatly appreciated, despite the drawbacks of a western aspect and lack of shade.

Naturally, there has been more than one belt of sand dunes formed during the westward extension of the Adelaide Plains. Such features are mostly transitory, and few traces of them remain. There is, however, one belt of old sand dunes that should be mentioned, since it evidently marks a physiographic feature which existed for a considerable period of time. The belt of old dunes is of some economic significance, in that they supply garden sand, building sand, etc., also because they supply dry and varied areas on the otherwise swampy plain.

The dunes are up to fifty feet in height, but are irregular and discontinuous. At Seaton and Glenelg they have supplied sites for golf-links. They stand about 1½ miles back from the coastline and probably mark the last period of stand-still of the shore-line.

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Chapter III

Climate and Vegetation *[Date stamp]* 27 SEPT 1928

Now that we have considered the relief, the structure, and the formation of the Sturt River Valley and its environments, we must consider another factor which is, geographically, just as important if not more so. This factor is the local climate and its peculiarities, which consist of the average weather conditions and the variations from that average. Since the variations in the natural vegetation so closely corresponds with the variations in climate, we will find it convenient to consider, in this chapter, the natural plant-cover also.

The climate of the south of South Australia, and incidently also of South-western Western Australia and of Victoria, is of a Mediterranean type—so called because it so closely resembles the climate of the lands surrounding the Mediterranean Sea. The main characteristics of this kind of climate are three-fold:

1. Rain falls freely during the winter half year.

Climate & Vegetation (continued)

2. Summer is a period of comparatively drought, two or three months of which may be totally rainless.

3. The annual range of temperature is comparatively small for the winters are mild and the summers not hot. The range is small even at the highest altitudes in the Sturt Valley.

The reasons for the presence of this type of climate, are given by the swing of the wind-belts with the sun, so that the region comes within the zone of the westerly winds and those resulting from the Antarctic depression in winter, while in summer these winds have moved to the south, and the Trade Winds do not come sufficiently far south to be of any value to the Sturt Valley.

No lands having this kind of the climate are found far from the sea; it is a distinctly coastal type of climate and is found only between

Climate and Vegetation (continued)

the latitudes 35° and 40°. The highlands are naturally both cooler and moister than the plains—they are at least 10° cooler than and it is an interesting fact that Mount Lofty Summit receives nearly twice the rainfall of Adelaide, though it is only a few miles distant. There is also a greater daily range of temperature because rapid radiation leads to cooler nights. The average range between the hottest and the coldest months is 20 to 25 degrees, on the plains, but this becomes greater with altitude. Variations in temperature, however, both in daily and in monthly ranges, are most necessary to man in warm countries, and it is the comparatively severe changes in the hills which make them so much healthier than are the plainlands. The highest shade temperature ever experienced near the Valley was 116° Fahrenheit in 1858 while the lowest ever recorded was 32° in 1908. These records were experienced in Adelaide, but they will serve as

[Following page: Diagram with caption]

The Average Monthly Temperature of the Adelaide Plains. (70 Years)

Climate & Vegetation (continued)

illustrations when dealing with the Sturt River and environments. this range of temperature of 84°, at first seems very high, but we must consider the fact that it is exceptional. Also we should, before passing our verdict upon it, compare it with the ranges of other lands. Then we see that it is not half the average range of Siberia (171° Fahrenheit), and nearly half the average range of North America (153°). Thus on second thoughts we may consider a most exceptional range of 84°, as being comparatively small. The exceptional range in Siberia must be somewhere near 200°—possibly more.

Winds which blow in the valley are mainly of three kinds—permanent, periodic, and occasional (such as cyclonic disturbances). The permanent winds bring the primary rainfall, the periodic winds a secondary winds, \rainfall/ while the occasional winds have a great local influence. These winds require considerable explanation.

[Following page: Diagram with caption]

The Permanent Winds

Climate & Vegetation (continued)

Air flows from areas of high pressure to those of low pressure, where usually an “up-draught” has been created by lower \higher/ temperatures. This accounts for a great interchange of atmosphere between tropical and polar regions, for as some currents rise and flow polewards from the hot lands, others move toward the equator to take their place. This interchange is illustrated in the diagram.

Those winds which move poleward are not found on the surface until between the latitudes 30° to 60° . The winds are originally north-west antitrades (in the Southern Hemisphere), but when they are felt on the earth's surface they have been changed by the rotation of the globe to westerlies—"Brave West winds"—or even south-westerlies. These winds are strongest near the latitude of 45° , and as we go further south we find them weaker as we are nearing another high pressure area.

The equator-bound winds are found

[Following page: Hand drawn map with caption]

A Map of southern South Australia showing

1. Westerly Winds. (Winter.)
2. South East Trade Winds. (Summer.)
3. Monsoonal Winds. (Summer.)

Climate and Vegetation (continued)

on the surface of the globe between the equator and the latitudes of 30° north and south. These are known as the "Trade Winds" and have no effect upon the Sturt Valley, as it is out of the area of their activity. (It is 35° south)

The westerlies, however, do have a great effect upon the climate of the area. The movement of the sun northward in winter time brings the land ~~the~~ as within the orbit of these permanent winds, which sweep across the south of Australia and deposit moisture on their track. The mountains in the Sturt river valley form an admirable condenser to the moisture in the winds. In Summer, on the other hand, this belt has passed well down toward the Antarctic, but the area of tropical low pressure has also advanced southward. The low pressure area is responsible for some of the meagre summer rainfall in the Sturt Valley for it causes the periodic monsoonal winds, which are drawn

[Following page: Two diagrams with headings]

Sea-Breezes

Land Breezes

Climate & Vegetation (continued)

inward by the heat of the continent. The North-west Monsoonal winds, however, very occasionally reach the Sturt Valley. When they do, they produce hot sultry conditions which are sometimes followed by rains. A minor type of periodic winds felt in the Sturt Valley, are the land and sea breezes, caused by the relative coolness and warmth of the sea and land, by day and night. These winds, particularly the cool sea breezes during the daytime, are, to some extent, responsible for the growth of sea-side towns and sea-side resorts, such as Glenelg and Brighton.

The occasional winds are really wind eddies on the edges of the main systems. They consist of two types—anti-cyclones or areas of high pressure with out-flowing winds on the surface of the earth; and cyclones or areas of low pressure, with inflowing winds on the surface. The movements of these "highs" and "lows", as they are designated, are not

[Following page: Two diagrams with captions]

The anticlockwise action of a Cyclone

The clockwise action of an Anticyclone.

Climate & Vegetation (continued)

thoroughly understood. They cannot be accurately forecasted as can periodic or permanent winds. However, we do know what they are and what are their qualities.

The lows are of two types—Monsoonal and Antarctic. The Monsoonal lows move spirally from the North-west of Australia to the South-east but seldom come so far south as to effect the Sturt Valley very much. Even if they do reach that area they are usually become bereft of

all moisture and therefore are “water-drinkers”. They produce hot and sultry conditions in Summer time, for only then are they in action. The paths of the Antarctic lows are on the Southern Ocean, and across the southern coastal regions of Australia. They therefore pass over the Sturt Valley and the mountains there, cause them to deposit moisture. This occurs mostly in Winter for in Summer the “lows” move southward as does the sun, and the permanent wind belts.

[Following page: Two diagrams with captions]

A typical Winter Weather Map (12.7.28)

A typical Summer Weather Map. (11.0 [overwritten with] 1.28)

Climate & Vegetation (continued).

The “highs”, which are the most prevalent atmospheric conditions to pass over the Sturt Valley, move from west to east, and vary in number from four to seven a month. They move at approximately 500 miles a day, and are frequently as large as Australia in extent. They are accompanied in front by cool conditions, and in the rear, by rising temperatures and north winds. The Southern lows are smaller ~~are smaller~~ and have a greater velocity, and they are preceded by north winds and warm conditions and followed by cool westerlies. Thus we see it is natural for a “low” to follow a “high” and a high to follow a “low”, but in Summer time especially the “lows” are often/ so small and so weak as to be negligible. Even in winter time there is a predominance of “highs” over “lows” in the Sturt Valley.

Rainfall is by far the most important

[Following page: Diagram with caption]

A Diagram showing the average monthly rainfall of the Adelaide Plains.

The average is of 88 years’ records.

Climate & Vegetation (continued)

climatic element in the valley or in any other part of the State. As has been explained it receives practically all of its rain from the southern Ocean, its primary source. The secondary source is in the Indian Ocean via the Monsoonal lows, and, in a few cases, via the Southern lows. ~~He~~ The highlands of the Sturt Valley receive a higher rainfall than any other part of the State—Mount Lofty Summit receives almost fifty inches per annum. The rainfall varies most decidedly with the altitude, as hill slopes cause the air blowing athwart them to rise and expand, as a consequence the temperature may be reduced so far as to cause condensation and rain. The changes of rainfall with varying height is given in the following illustrations

1. Belair is 1,009 feet above sea level and receives an average rainfall of 28.13 inches per annum.
2. Stirling West is 1628 feet high and receives an average of 45.9 inches per annum.
2. Mt Lofty Summit is 2,334 feet high and receives 47.3 inches of rain annually.

[Following page: Diagram with caption]

The effect of verticle relief on Rainfall showing a resulting “rain-shadow” area.

The shading represents precipitation of moisture

Climate & Vegetation (continued)

There are, in the Sturt Valley, as in all other regions which include highlands, several examples of “rain-shadows. These are caused by a higher region stopping the rain-bearing winds from reaching a lower region; those winds blowing across the higher region, which are not stopped and condensed by it, blow so far above the lower region, as to avoid condensation altogether, or as to deposit a much smaller amount of moisture than the higher region received.

There are many cases of “rain-shadowing” throughout the Sturt Valley. Every slope facing east and north-east, for the reasons given above receives more rain than do the slopes facing west and south-west, for the rain-bearing winds come from the latter directions. This “rain shadow” has an important effect upon the areas concerned because of the lessened rainfall, and also because of the consequent absence of strong winds. No very large area of such a kind, however, is found in the Valley.

Climate & Vegetation (continued)

The following have been given as the four more important causes of rainfall on the area under consideration

1. The movement of moist air from warm to cooler latitudes or zones, as when a tropical low extends southward.
2. By falling barometric pressure, as when an Antarctic low sweeps along the coast
3. By rising barometric pressure when the low centre has passed over and an oncoming high causes a crowding of isobars.
4. By the forcing of moist air currents from sea level to higher and cooler regions by the sea coast and the highlands.

We have seen, in our previous consideration of the climate of the Sturt River Valley, how all these factors apply in that region. The first factor is the least important. Also two of the factors may be combined and so

Climate & Vegetation (continued)

cause precipitation especially factors two and four and the factors three and four.

While considering the rainfall of the valley, we must also consider dews, frosts and fogs, which are experienced in the Sturt Valley. At a particular temperature a given volume of air can hold only a certain amount of water vapour, and no more; the air is said to be “saturated” when it is in this condition. Hence when air is saturated at a certain temperature and then cooled, there must result a deposition of moisture. After sunset land is often colder than the air, which is thereby cooled and caused to deposit its surplus water vapour as dew, or, in extreme cases, as frost. Fogs are caused in a similar way. These three occurrences, dews, frosts, and fogs, are all fairly common in the Sturt Valley because of the presence of the highlands as a condensing agent.

[Following page: Diagram with caption]

Diagram showing soakage, bed of the subterranean river on the impervious rock strata, and the spring where the ground water issues for underground.

a = places of soakage

sp = the Spring

Climate & Vegetation (continued)

Vegetation in the Sturt River Valley is distributed according as the distribution of, and variations of, topography, climate, rainfall, ground-water, and soil. As the topography, climate, and rainfall, have already been discussed, we will now consider the last two factors. Ground-water is quite an important factor in the area we are studying, and it has a decided effect both upon vegetation and upon man’s pursuits. The origin of this ground water is primarily in the rainfall. It is that water which has soaked into the ground, and continues to soak until it reaches some hard rock strata which is impermeable. The ground then becomes saturated and the hard strata becomes a subterranean river bed. This water continues to flow underground until it reaches some outlet above the ground grounds such outlets are known as springs and may just ooze out of the ground or they may flow out in a stream. Such an outlet may be merely

[Following page: Photograph with caption]

[Date stamp] 1 JUNE 1928

Near the Mouth of the Gorge at Sturt

Showing the denuded hill slopes and rich fertile valley.

Climate & Vegetation (continued)

the place where the hard strata comes to the surface, or there may be some rift up which the ground water is forced by the hydraulic pressure of the stream.

Soil is the deciding factor for the natural vegetation, for the absence of it means the absence of growth of any kind. If the transporting agents (wind, rain, etc.) are unable to carry away the smaller particles of rock waste, it is left behind in the form of soil. Plants, by their decay, supply organic matter which gives rise to a dark, fertile soil called "humus". Animals also furnish organic matter. Soil is constantly being stirred up and moved by burrowing animals, earth-worms, wind and rain. Thus in the Sturt River Valley our chief concern is the distribution and texture of the soil.

In the area with which we are concerned we note that the valley itself is covered with deep soil, but

[Following page: Diagram with caption]

Rain-Wash held up by trees and banks.

Climate & Vegetation (continued)

that the slopes are comparatively bare. This is because of the rain wash and action of the winds, combined with the force of gravity. Soil tends to leave the slope for the lower valley. In the we may see the great benefits to be derived from afforestation, in reference to the soil conservation. The tree roots and a bushes will hold up the soil above them and thus stop erosion. The decayed leaves, too, would be a valuable supplement to that soil. The trees themselves will intercept the heavy showers which are so destructive to the soil, and cause the rain to drip without so devastating an effect. Also rocks, hedges and banks may arrest soil in the same way as the trees do.

Alluvial deposits are a most important kind of soil because of their texture. They are mostly made up of decayed vegetable matter and weathered rock. The formations, the reasons for, and the frequency, of such deposits have been discussed in the previous chapter and

[Following page: Photograph with caption]

[Date stamp] 18 AUG 1928

Willow and gum trees growing by the Minnow Creek at Long Gully, National Park.

Climate & Vegetation (continued)

hence may be omitted here. It may be mentioned here that men have devised many different ways of conserving all the soils in the region. These means, however, could be more appropriately considered in a succeeding chapter on "Cultivation".

There are, roughly, three kinds of vegetation found in the Sturt Valley. They may be classed as trees, shrubs, and grasses. These, of course are much inter-mixed, and grass is to be found almost every where. Newbigin, in the "Mediterranean Lands", classes them as High Forest, Maquis, and Garigue. These three kinds of vegetation depend; to a large extent, upon the depth of the soil. A tree must have fairly deep soil for its large tap roots, to obtain and sustain the life of the tree. A shrub, however, has roots which spread horizontally much like the upper part of the bush and thus requires a small amount of soil. Grasses, too, do not demand a very thick soil, but can grow in a

[Following page: Photograph with caption]

[Date stamp] 18 AUG 1928

Typical natural vegetation near Upper Sturt.

Climate & Vegetation (continued)

soil which is an inch deep or even less. Of course both grass and bushes do grow in the deeper soils too, but trees find it hard to exist where there is not sufficient soil, and they usually become bushy and stunted in such parts.

Thus on gradual hills lopes, and in the valleys where man has not encroached upon them, we may see the typical Australian forest land with its Eucalyptus and Peppermint gums and wattles predominating. Between these trees are bushes and shrubs most of an acacian origin, with their thorns and prickles to resist animals. These bushes, then, are crowded with a luxuriant undergrowth of ferns and grasses. All through the valley, such vegetation did exist and does still exist except in the Adelaide plains. Along the river banks, and in a few isolated spots we may see the remnants of this vegetation, in the plains. In the hills however the vegetation of the hills at National Park is typical of southern Australia. It

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

Natural Vegetation at Coromandel Valley, showing thick growth in the valley and the sparsely covered slopes (to the right of "snap")

Climate & Vegetation (continued)

is the predominant feature of the vegetation, and so we must now consider the variations. On the steeper slopes, because of the absence of a thick soil cover, the vegetation is not so thick and there are but few big trees. What trees there are, are generally stunted. Low bushes predominate and there is a fair amount of grass; the number of ferns, however, have shown a marked decrease. Vegetation is distributed in this manner on the \steeper/ slopes in the young river valley between Upper Sturt and Coromandel Valley. On the less steep slopes and toward the base of the hills, however the vegetation tends more and more to the High Forest type. In the Sturt Gorge, the vegetation is more marked in the absence of luxuriant growth, because of the excessive steepness. Grass predominates, and here and there are small bushes, while there are but few isolated trees near the bottom of the valley.

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

Typical of Gorge areas.

Grassed slopes with scattered bushes, and thicker vegetation in the valley itself.

[Following page: Photograph with caption]

[Date stamp] 18 AUG 1928

Young trees growing to the west of the Long Gully oval, near the Railway dam.

[Following page: Photograph with heading]

Sturt River near its confluence with the Patawalonga.

[Date stamp] 15 AUG 1928

Climate & Vegetation (continued).

There is but one more area which varies, in vegetation, from the general type, and that is very much different from it. The land near the mouth is low-lying and often flooded, both by the river and by the tide. This means that the soil is very salty and marshy. The ordinary vegetation cannot exist here, but there is a vegetation peculiar to such an area. There are grasses in the less marshy areas, but in parts even grass cannot grow. The plants that do grow are stunted shrubs like saltbush, "pig face" and a course undergrowth of shrubs and weeds. This area, because of its origin, is the one, and only, part of the Sturt River Valley which is not pleasing to the senses.

[

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Chapter IV

Cultivation [Date stamp] 8 OCT 1928

It requires but little reflection to grasp how much effect the contour of the land would have upon the pursuits and the industries of man, in the Sturt River Valley. The area is comparatively small and the rainfall hence varies only with the contour. The climatic conditions throughout the Valley, and the social and political influences must be the same. So we may see that topography must be ~~the~~ the deciding factor for what cultivation will be carried on, in the different parts of the valley. There is perhaps only one factor, which is not contour, which has an important effect upon production. This is which way the slope is facing, for a slope facing the sun is far warmer and more suited for cultivation than is one looking to the other way. This is especially important in the higher regions, for there the air is rarer, and hence the sun's rays have a greater effect. This is a deciding factor in the cultivation of grapes and currants especially, because they need the heat of the sun to ripen them, and the more heat they receive, the better.

[Following page: Photograph with heading]

Currant Vines and Almonds on the property of Mr Weston, near the Marion Road, Sturt. They are on a slope facing north-west.

[Date stamp] 15 AUG 1928

Cultivation (continued.)

It is quite noticeable that, near the South Road at Sturt, vines predominate on the southern slopes of the valleys and are comparatively scarce on the northern slopes i.e the slopes to the north of a depression or valley. This factor influences all fruit culture in the Sturt Valley, though not so much as it does the vine growing. Despite all this, however, contour is the most important factor.

It decides the distribution, the fertility, and the texture of the soil. It decides whether there will be a thick or thin soil cover, and where the river will deposit its sediment which is so full of humus and chemicals, and is so necessary to plant life. It is easy to see the reasons for this, and, as they have been considered in a previous chapter they may be omitted here.

We have seen in Chapter 111 what an important bearing the formation of the country has upon natural vegetation. It has an even greater and more direct bearing

Cultivation (continued)

upon the distribution of the cultivated vegetation. Some crops demand flat and undrained soil where there is much soakage, while some, a sloping soil which is well-drained, some demand land facing the sun, and some height and comparative coolness.

The foothills of the Sturt Valley and much of the plainland, were first used to produce large quantities of wheat and hay. Because of the nearness to Adelaide, however, it was soon found more profitable to cultivate more intensely, and produce fruit and vegetable for the near market. Then the flats were found to be more valuable as residential areas than as wheat farms or orchards. The business men of Adelaide have homes in this area of the Adelaide plains, all the way from Marion to Glenelg. The absence of obstructions to communications in this area, facilitates the building of good roads and fast railways to convey the business men to their city offices daily. A fuller consideration of

Cultivation (continued)

these points will appear later when considering the social aspect of the Sturt River Valley. In the "young" river valleys of the Sturt Valley, little settlement has been made by man, and it is in those parts where the earning of a livelihood is most difficult. This is almost wholly because of the inhospitable nature of the areas. The valley, as we know, consists of a narrow stream bed with steep sides. No cultivation or agriculture of any kind is practised. The soil is

very thin and if it were once disturbed for cultivation, it would be washed away. It is possible that this could be stopped by the building of walls and the making of short terraces, but it would be very costly, and the area so maintained for cultivation would be small. Also access would be most difficult, and spade culture only would be possible. Thus conditions do not warrant the cultivation of such areas.

When considering natural vegetation, it was seen, in “young” valley areas the

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

This snap of the Sturt Gorge, serves to show how impossible it would be to cultivate a “young” river valley.

Cultivation (continued)

slopes are covered with grass with a few trees in the less steep parts. These are responsible for the only two industries of the area—sheep pasturing on the grasses, and timber cutting for firewood. Sheep are the only animals which could thrive in such an area. They are naturally given to wandering and are very sure-footed. They browse on the slopes on the scanty grasses, and wear for themselves narrow tracks upon the steep hillsides. Wood-cutting on the less steep slopes is, and has been, fairly important because of the demand for firewood in Adelaide and its suburbs. The nearness of the Sturt Gorge areas to Adelaide has led to its being practically deforested. The lack of transporting facilities and of ease of access, however, hampers the industry greatly.

The “mature” river valleys of the Sturt are a series of orchards and vegetable gardens, and it is here that the topography of the area has so great an effect. There are three stretches of mature valley along the

[Following page: Photograph with caption]

[Date stamp] 18 AUG 1928

A “mature” valley near Upper Sturt showing a few fruit trees in the valley, while the lower slopes are cultivated

Cultivation (continued)

Sturt River—on the Upper Sturt & M^t Lofty Shelf between the source and Upper Sturt; on the Coromandel Valley shelf; and through the foothills at Sturt. There is a marked difference between these three areas as regards their production especially, although there are many similarities.

The highest step or shelf produces on its lower slopes, such fruit trees as apples, pears, walnuts, and quinces. The highest rainfall is received in this area, and it is also comparatively cool, hence the production of cool temperate fruits. Mediterranean fruits such as apricots and peaches are very scarce. At the bottoms of the valleys, on the flood plains and terraces spring and summer vegetables (turnips, parsnips, beet.) are grown, and there are a few orange groves, though they do not thrive as well as those grown on the lower levels. The production for which this area is economically the most important is the late production

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

An Orange Grove near Coromandel Valley. Note the pumping plant in the foreground and the forested slopes above the grove.

Cultivation (continued)

of vegetables. Because of its height the area can grow for the market, vegetables for the Adelaide market, in the late summer, after all the vegetables in other areas are done. On the steeper slopes there is, to a great extent still the natural vegetation, thus giving an area for

obtaining timber, and also firewood to supply private homes and bakers with their requirements in that direction.

In the Coromandel Valley area there is a marked change. Still apples are perhaps the chief crop on the slopes but there is a large quantity of apricots and peaches grown also. Here, too, the climate is noticeably warmer and verging on Mediterranean.

As one enters Coromandel Valley there are to be seen on the upper slopes fairly large areas of much ~~wea~~ unrealised wealth in the form of timber, while on the lower slopes near the river are numerous prosperous orange groves, irrigated by

[Following page: Two photographs with captions]

A prolific apple-tree growing on the eastern slopes of Coromandel Valley

[Date stamp] -1 JUN 1928

The apricots on the southern slope of Coromandel Valley, The camera, when the "snap" was taken was looking into the Valley

[Date stamp] -1 JUN 1928

Cultivation (continued)

water pumped from the river. The form of Coromandel Valley itself, is rather peculiar; it is a broad flood plain surrounding on all sides but the north-east by slopes. The eastern and southern slopes of the valley are planted with apple-trees and apricot trees respectively while the north and west slopes are forested. Near the bottom of the eastern slopes are a few fig trees and quince trees and an old homestead out of repair. The flats themselves are intensely cultivated with the same vegetables as on the upper shell but also cabbages and cauliflowers. Strawberries and tomatoes are grown in smaller quantities. It is interesting to note that, in conjunction with this orcharding and market-farming, a small domestic dairying industry is being carried on. A snap showing two calves browsing on the flats appears on the succeeding leaf.

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

Coromandel Valley showing the cultivation of the flats. This is looking westward.

[Following page: Two photographs with captions]

[Date stamp] -1 JUN 1928

Coromandel Valley looking southward.

[Date stamp] -1 JUN 1928

Two calves browsing on the flats at Coromandel Valley

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

Orange Groves, Apricot trees and pastured slopes west of the Sturt Gorge.

Cultivation (continued)

Then at Sturt there is another change. Apples, pears, quinces, and plums are almost non-existent, but there are many apricots, peaches, oranges, lemons, and almonds grown. It is a rather interesting fact that almonds will not grow at high altitudes at all. Vines, too have now appeared on the sunny slopes. On the flood plains there are again the orange groves and the vegetables. Root crops, except as early vegetables have almost disappeared, and in their place are tomatoes, cucumbers, and gherkins. Cabbages and cauliflowers are also grown. A most important of vegetable growing in this area, is the glass-houses in which early summer vegetables and tomatoes are grown. On the higher and steeper slopes of this area,

pasturing of horses, sheep and cattle is practiced, for those slopes have long been deforested to obtain firewood for city wants.

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

Nearing the Gorge areas above Sturt. Here are glass houses, apricot trees and peach trees, and deforested pastured slopes.

[Following page: Two photographs with captions]

[Date stamp] -1 JUN 1928

Looking through the "mature" valley to the Adelaide Plains, showing orange groves in the foreground, and, further back, apricot and fruit peach trees.

[Date stamp] 15 AUG 1928

Glass-houses near Marion—early tomatoes are being grown.

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

A rare occurrence near the South Road at Sturt. Vines and apricots are being grown in alternate rows.

Cultivation (continued)

Hence it is seen in considering the cultivation of the "mature" valleys, how the products of the sides and the bottoms of the valleys differ. This is because of the requirements of the trees differ. Many fruit trees such as apple trees and apricots trees, demand a fair rainfall but require drained land. Thus they are planted on the slopes. In many cases water is pumped to above the orchard, from the river and allowed to flow in channels among the trees, and hence drain back to the river.

Oranges demand much water and have to be irrigated well. They grow best if the soil is kept continually moist. Thus they must necessarily be grown where there is access to plenty of water—that is, on the flood plains and haughs of the river. The ground may be continually cultivated here, and it is quite easy to pump water to the head of the grove and allow it to run slowly, through channels, back toward the river. The ground in such places, too, is usually kept fairly

[Following page: Photograph with caption]

[Date stamp] 15 AUG 1928

An empty field near the Bay Road being cultivated for cabbages and cauliflowers.

Beyond is a street of residences, probably of Adelaide businessmen.

Cultivation (continued)

moist through ground water soakage. Vegetable cultivation demands a rich "humus" soil which is flat, easily worked, and irrigable. Hence they, too, are grown on the river flats. There is intensive cultivation with the spade and hoe principally, and the soil is kept damp either by ground water or by continual irrigation, from the river, or from wells which are fairly numerous in these areas.

The Adelaide Plains area, as was previously stated, is chiefly a residential area, but there are considerable primary industries carried on also: There are still a few isolated farming lands growing wheat, mainly for the fodder, but this industry is limited because of the relatively high value of the land. Wheat production would hardly pay the interest on the value of the land. There are a few orchards, too, but these, also, are isolated for the same reason. Fruit cultivation is chiefly confined to the higher and more sloping areas. Then, again, there are a number of

[Following page: Photograph with caption]

[Date stamp] 15 AUG 1928

A vineyard near Marion. The vines are evidently very old.

Cultivation (continued)

vineyards, which are mostly old, and were planted before the area became residential. There are quite a number of nurseries along the old river valley on the Adelaide Plains including the widely known Kemps and Hacketts at Oaklands and Edwardstown respectively. Here seedlings of vegetables, tomatoes, and of fruit-trees are grown, to be sold to cultivators of the Sturt Valley for market-gardening and orcharding purposes. Experiments are conducted on plants so as to ascertain how to gain from them the best results. Flowers also are grown on such nurseries.

Quite near the mouth of the Sturt River there is a Government Lucerne farm, run in connection with the Hydraulic Engineer's Department. It is quite a valuable product and meets with a ready sale as fodder, and it grows on land unfit to produce any other crop. On the lucerne, dairy-cattle, race-horses and poultry are fed.

On the flat, salty marshlands, a

Cultivation (continued)

considerable number of dairy cattle are raised. These cattle can live and thrive on the grass, salt-bush and mangroves of the swamps. The rearing and training of race-horses is an important industry on the low grasslands of Morphettville and East Glenelg. The firm, flat grassed lands are most suited to the training of the horses and the green succulent grasses are the best fodder they could have. One of South Australia's most important racecourses, is just on the side of the Sturt River at Morphettville, and water for the horses is pumped from the river.

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[Date stamp] 15 AUG 1928

The Sturt River near St Leonards Note the dairy cattle feeding on the peculiar vegetation.

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Chapter V

Methods of Cultivation [Date stamp] 11 OCT 1928

With the increase of production, and with the resulting increase in the competition of production, in the Sturt River Valley, the orchardists, market-gardeners, farmers, and vignerons, of that area, are becoming aware that they must seek means so as to obtain the best results possible from cultivation; the best possible results for the labour and capital expended upon it. There is a growing need for more economic means of production, and the Sturt Valley cultivation is the most intensive of any part of South Australia. Producers must aim, not as so much at a the highest possible immediate return, as at a ~~een~~ the highest possible continued yield. They must not sacrifice returns for future years, for an immediate one; they must not "mine" the soil, as it is called.

Soil destruction in most parts of the Valley which are cultivated, is more rapid the formation of new soil. One of the great problems, then, of

Methods of Cultivation (continued)

the cultivators in this district is the prevention of soil wash, caused by rain and rivulets upon the slopes. As it is not practicable to form these slopes into terraces, as is done in some of the Mediterranean Lands, nor yet to use the spade and hoe to such an extent, the cultivator must adopt another method. He ploughs his land around a hill, tran's/verse to its contour, and not up and down it. These is ~~feroughs~~ \furrows/ so formed will catch the rain and cause it to soak in before it ~~cau~~ \can/ any damage in the form of soil-wash. If furrows were

ploughed up and down a slope, the water would naturally run down- these furrows and carry much valuable soil down with it, and soon was large channels.

Modern farming instruments are utilised through-out the Valley, but it is noticeable that, though power farming by tractors is superseding the use of horses in the less steep areas—Sturt and Marion and

[Following page: Photograph with caption]

[Date stamp] 15 AUG 1928

A large Fordson Tractor used in ploughing a vineyard at Marion. Even the “finishing”—the ploughing right against the vines—is done by the tractor with a special plough.

Methods of Cultivation (continued)

the Adelaide Plains—horses still hold their own in the hills. This is because tractors cannot show any superiority over horses when climbing slopes, and the unwillingness to handle a tractor on the slopes.

There has been recently put on the market by Kemps—nursery men near Oaklands—a small tractor for use in orchards and vegetable gardens. It has a small yet powerful engine, and is about three feet high and not two feet wide. It has two wheels, one on each side, and is driven by a long handle straight back behind it. One who drives the tractor walks behind it. Because it is so low this tractor is especially adapted to orchard work, for it can pass under the spreading branches of a tree and hence plough very close to the but of the tree with its specially made plough or cultivator. It can also be used for cultivating between rows of young vegetables for the wheels are just

Methods of cultivation (continued)

far enough apart to allow them to pass on either side of a row of vegetables, yet not far enough to cause them to encroach on the next rows.

Perhaps the most important problem of the Sturt Valley cultivator is how to maintain the fertility of the soil. Some orchards, which are in the richest gully lands—lands holding much organic matter deposited by the river and washed down from the hillsides—may last for generations yet, and not need refertilisation. But there are many naturally less rich lands which, through the cropping to which it is put, loses a large proportion of its fertility. It is the problem of the cultivator, how to restore the fertility Soil is made up of many mineral constituents such as potash, phosphoric acid, nitrogen, lime, and magnesia, to name the more important ones. Different plants require different constituents for proper growth, and, in growing they extract some of those constituents from the soil. If the

Methods of Cultivation (continued)

same crop is grown on the same area, year after year, the supply of mineral forms of fertility desirable for that crop, would be greatly diminished. A New York University has issued a statement in illustration to this. It says —

An acre of ground carrying 35 apple trees which, in twenty years of cropping would yield 10,500 bushels of apples, remove from the soil in fruit and foliage approximately 1,337 lbs of nitrogen, 310 lbs of phosphoric acid and 1895 lbs of potash.

The most elementary form of re-fertilisation is to keep tilling the soil and so mixing its constituents and moving them. It often happens that the roots of a tree may exhaust a small portion of the earth while quite a fertile portion may exist close by. Tillage mixes these soils and so puts into use the dormant fertility.

It is most important, in orchard lands especially, to have a proper ratio between organic matter and inorganic matter—the latter representing purely the mineral

Methods of Cultivation (continued)

constituents, and the former, that which has once been built up by life and has not completely resolved to its mineral elements. There are two well known methods of supplying

organic matter to lands:- the natural method consists of ploughing or digging in, crops which have been grown on the land; and secondly, the artificial method which consists of the addition of extraneous organic substances, such as animal manures, and decayed vegetation not grown on that soil.

The former method is still in the experimental stage in the Sturt River Valley. The growing of peas—ordinary or field peas—which are ultimately ploughed in, is a recognised method of returning nitrogen to the soil. The latter method, however, is old and tried and has been used for centuries in many parts of the world. To obtain the fullest benefit, the manure is scattered broad-cast during the early winter season over the whole area, presumably the orchard. It should then be ploughed or dug in, and,

Methods of Cultivation (continued)

as far as possible, distributed evenly in the soil.

Up to this stage we have considered only the green and bulk manures, but they are very elementary, and may have the effect of supplying too much of ~~the~~ some chemicals. If too much nitrogenous manure is used in an orchard, there results a production of much wood and foliage and consequently less fruit, and both the foliage are soft and more liable to injury from the weather, fungus diseases, and insects.

Thus, in recent years, artificial manures have been used more and more widely. The use of such manures enables a producer to put into the soil just what it needs. In the soil of the Sturt Valley there are natural shortages of phosphoric acid, an abundance of potash, rather poor nitrogen supplies (except in river bottoms), and a good quantity of lime. Additions of phosphoric acid leads \to/ only a moderate growth of a strong healthy character, and,

Methods of cultivation (continued)

as a consequence, a moderate growth of fruit buds. The fruit then, is large and healthy—not very liable to fungus diseases.

With the scientific advance in farming and fruit-cultural methods in the Sturt Valley and surrounding areas, the South Australian Government have conducted experiments to see what chemicals certain crops demand of the soil, what soils need re-fertilisation, and the best way to apply the needful chemical manures. The question of the Sturt Valley producer at the present time is:

“Which manures shall I apply, and how much of each ~~of~~ should be given? This question as yet, has not been adequately solved, but the co-operation of the Government and the producer in the problem ~~shoud~~ is giving and will give very satisfactory results. The most important thing is this question is that the producer must know his ~~of~~ own holding most thoroughly; or, if he does not, he must experiment upon it until

Methods of Cultivation (continued)

he does, or he will not gain the best results from it. The South Australian Government has an experimental orchard at Coromandel Valley, and it has also a department which will examine any sample of soil sent to it, and give ~~an~~-advice as to how to treat it. Hence we may surmise that, with this co-operation of Government and producer, the problem of re-fertilisation of soils in the Sturt Valley, will soon be solved.

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Chapter VI

Pests and their Prevention [Date stamp] 17 OCT 1928

Throughout the Valley, fruit trees, fruit, and vegetables are subject to diseases and deterioration by pests, and each producer must take preventative measures to insure his crop against such detereation Most of the common diseases are caused by the depredations of small insects and grubs, ~~and~~-or/ by minute parasitic plants called “fungi”. The insects damage trees and vines in two ways. Some kinds such as caterpillars and beetles, gnaw

away and devour parts of the leaves, stems, roots and fruit; others, such as aphides, scale insects, and plant bugs, though they have no jaw for chewing, possess a hollow pointed trunk, with which they pierce the tender parts only, and so suck away the sap of the plants. The chewing insects are destroyed by coating their habitual food with some poison, such as an arsenical compound, which the pest will eat and soon die. The suctorial insects cannot be killed in this manner, but may be destroyed by throwing

Pests (continued)

upon their bodies such liquids as tobacco-wash, kerosene, or resin-compound, which burn away their tender skins; or, further, they may be suffocated with poison gases such as carbon-bisulphide, or hydrocyanic acid gas. These gases, however, are only practicable when enclosed within a gas-tight covering.

It may be practicable to mention here, some of the common insect pests which the orchardists of the valley must combat. The Codlin moth lays its eggs in the flower of the fruit, and when the caterpillars hatch, they feed on the fruit, which has by that time, formed, and burrow holes in it. These are most persistent in apples. The approved manner of eliminating them is to spray the blossoms with arsenate of lead. Curculio beetles hide in the soil during the day time, but at night they climb into the trees and eat the young bark and edges of the leaves. Arsenate of lead, or kerosene is sprayed upon the trees to kill these beetles. Certain poison "dusts" may also be used,

Pests (continued)

(e.g. Paris Green and flour). Boring caterpillars are killed with a spray of carbon-bisulphide or benzene.

Black and other Aphides which are found on all Mediterranean fruits and Red Scale which is found on Citrus fruits, are treated with hydrocyanic gas or, in less serious cases, sprayed with kerosene emulsion or resin-wash. The Red Spider and Bryobia mites, on some fruits, have proved serious in the Sturt Valley, but treating with a kerosene spray will cope with them. Mussle Scale and Blight are treated in the same way

Fungus diseases grow either upon the surface of the trees or within their tissues. Mildews spread over the surface but do not penetrate the branches. The odium of the grape vine is an example. These may be destroyed by dusting sulphur upon them or by spraying them with Bordeaux or Burgundy mixture. These mixtures are composed of bluestone, quick-lime and water.

Pests (continued)

and bluestone, washing soda, and water, respectively. Other fungus diseases penetrate into the fruit but are not visible to the naked eye, until the fruit becomes mature. Among these are the "black spot" of the apple, "the shothole" or "scab" of the apricot, and the "curl-leaf" fungus of the peach and nectarine. These must be prevented, for cure is not the question. This may be done by spraying either with the Bordeaux or Burgundy mixtures, when the trees are just bursting into bloom.

This last pest is the most persistent of all, and every orchardist makes a regular practice of spraying the trees every season, as a preventative measure. This fungus cannot be eliminated once it has gained a start.

Vegetables are also liable to such diseases and pests as are fruits and fruit trees. Insects and grubs eat into them—slugs—and they may contract some fungus disease or rot. The same measures of prevention and cure are taken as with

Pests (continued)

fruit trees, though "dusting" is more the general measure resorted to. Such poisons as sulphur, lime, lead sulphate, and "Paris green", are used.

The effect of these treatments depends upon three things:—

1. The use of the proper remedy—e.g. the only way to get rid of Red Scale is to fumigate with hydrocyanic acid gas.
2. The application at the right time—e.g. the spraying to prevent “black spot” and “scab” must be when the trees just burst into bloom.
3. Every affected part and every part which is likely to be affected, must be treated—not one small insect may be missed, for the multiply very rapidly and may soon cause considerable damage.

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Chapter VII

Industries of the Sturt Valley. *[Date stamp]* 28 OCT 1928

There are quite a large number of economic undertakings in the Sturt River Valley besides cultivation though that is the most important. They may be divided into four categories—extractions from on and under the earth’s surface, industries consequent to primary production, and to natural vegetation, and some miscellaneous industries, domestic and purely industrial.

Quarrying is quite a considerable industry in the Sturt Valley. Among the commodities quarried are slate, freestone, limestone, building stone, quartzite, talc and clays. The purple slate quarry at Tapleys Hill, though it has not is former industrial importance, is still being worked. It is, however, suffering from a decreased demand for its product. The old method of slate-roofing has totally disappeared, and slate floors for houses, except in very exceptional cases, are out-of-date. Thus its use is confined to curbing footpaths, for building stone, and such uses. The origin of slate is

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Industries (continued)

in the hard clay rocks which will split into thin parallel layers when a pressure is exerted on them. The pressure is naturally at right angles to the parallel layers of the hard clay rocks.

There are several freestone quarries in the upper Sturt valley especially near the town of Upper Sturt. A large quantity of pure freestone is being quarried on the property of Mr David, the neighbour of Mr Shield, on whose property there are the large springs discussed in a previous chapter. This freestone is most important for building purposes because it will set hard and is easily worked artistically. The stone itself is also attractive. Thus many fronts of ~~sub~~ suburban houses are building of freestone, and some houses are entirely so. When one considers the number of houses and buildings being erected one may imagine the immense demand for this kind of stone.

It is also an excellent stone for

Industries (continued)

road making, because it will crush and then set in a hard cement-like formation, thus presenting a firm, and, if the road is well made, smooth surface to traffic. This freestone is frequently used as top-dressing or “blinding” for macadamised roads.

One of the most important industries of this area, is the making of the well-known Brighton Portland Cement. The area from which the ingredients are obtained is outside the Sturt Valley in the valley of the Hallet’s Creek, but since the cement is made within the area, we may consider it an industry of the Sturt Valley.

This Portland Cement is an hydraulic mixture consisting of compounds of silica, lime, and alumina. It is so called from its resemblance, when set, to the Portland limestone of England. The intimately mixed ingredients are burned in a kiln to incipient vitrification, and the clinker formed is ground to a very fine powder.

Industries (continued.)

When this cement is mixed with water it sets slowly, owing to the interlocking of its minute crystals. This Brighton "kangaroo" cement is by far the most widely used cement in South Australia. This is due to the fine deposits which enable economic and excellent results.

Throughout the mountains and foothills of the Sturt River valley there are many strata of limestone. This has led, in some cases, to the establishment of lime kilns, and the burning of lime as an industry. This lime is most important in building especially.

There are a great variety of clays in the Valley, and they lead to three important industries—the mining and preparation of talcs (including soapstone and French chalk), the making of bricks, and the making of tiles.

The talc industry, though seldom considered, is none the less important. The talc, soapstone, and French chalk, are used for furnaces, lubrication, the

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

The Blackwood Brick Works

Industries (continued)

preparation of chalk as we know it, and in various rubber industries, mainly as an absorbent. There are large quantities of these substances in the Mount Lofty Ranges, and much of that which is quarried comes from near the Upper Sturt railway tunnel, Upper Sturt. The Blackwood Brick making, next to the Brighton Cement works, is the most important derivative industry in the valley. There is a large amount of clay, suitable for brick-making in the area, which has led to the establishment of several suburban brickworks. The others are at Marion. Large buildings (see snaps) and modern machinery have been built and installed, and the firm is prospering. As the majority of the buildings in these State are of brick, the value of such an industry as brick-making would thus be inestimable.

At Marion there were two kilns, one of which is still manufacturing bricks, but the other has been closed down and in the

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

A furnace of the Brickworks at Blackwood and a pile of bricks.

This "snap" was taken from ~~a~~ on another furnace.

[Following page: Photograph with caption]

The kilns of the Blackwood Brick works.

[Date stamp] 1 JUN 1928

Industries (continued)

kilns themselves, an orchard has been planted—twelve or fifteen feet below the surrounding grounds. The buildings themselves have been converted into a wood and chaff mills.

Near Cherry Gardens, in the valley of a tributary of the Sturt, there is a large deposit of a dark yellow loam or clay. This clay is dug up and transported to Edwardstown to the "Wunderlich" Brick Tile factory, where building and roofing tiles and glazed bricks, are made.

The clay can be worked artistically and it sets in a hard, rather brittle tile. In considering direct derivatives from the earth's surface, there are but two more things to consider—sand and gravel. Sand may be found at one or two places along the Sturt bed but in small quantities but near the sea coast and in the region of the old sand dunes, it is in commercial quantities.

This sand is important for building and other purposes. Gravel for paths and roads is obtainable in many places.

[Following page: Photograph with caption]

[Date stamp] 15 AUG 1928

The Sunken Fruit Orchard, in a Brick \kiln/ at Marion.

Industries (continued)

where quartzite stone is found but it is not quarried and crushed in very large quantities. Other quarries outside the Sturt Valley have the monopoly.

We may now consider those industries resulting from the natural vegetation. Timber, naturally, is a resultant industry though not very important. A small amount of stringy-bark is obtained in the valley but there are not many stringy bark gum trees growing. There are several timber and carpentering industries in Edwardstown, which may be classed as in the Sturt Valley. Most of the timber they handle, however, is imported. Cowells have a branch factory there and there is also Pengelley's main factory.

Much fuel is supplied to fuel merchants in the city and suburbs from the wooded slopes valley, giving use to another necessary and fairly important industry. The fuel is used by private householders for warming purposes and by bakers for their furnaces.

Industries (continued)

A fair quantity of wattle bark is obtained in the area from \the/ wattle trees. This bark has much tannin in it and is used for tanning hides for leather. Eucalyptus is obtained from gums in the area by such firms as Bickfords and Fauldings. This oil has great medicinal and antiseptic qualities. The product is used as a drug and in ore flotation processes.

We may find it convenient here to consider bees, and their industrial pro-duct, honey, because of their close relationship to the natural vegetation. At several places along the valley we may see bee-hives, on the slopes amongst fruit trees or amongst natural vegetation, especially peppermint gum. ¶There \is/ a large bee-farm at Coromandel Valley, a "snap" of which appears on the next page.

Now we come to the consideration of the industries resulting from the fruit production of the Sturt River Valley. Much of the fruit produced, as we have

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

The hives of the Coromandel Valley bee-farm.

Industries (continued)

seen, is marketed and sold in the city and suburbs. But there is quite a fair proportion of it which is not marketed but which is kept, and dried by the sun on trays, to be sold for consumption at such a time when no fresh fruit is available. Thereby the marketing of fruit in ~~such~~ some form or other continues all through the year, and if consumers may not have fresh fruit, then they can have the substitute.

Also, instead taking it to market, some of the fruit is taken to factories where it is preserved and bottled either for the local market or for export overseas. These factories are largely responsible for price-fixing, which is generally according to supply. So if there is a shortage the factories must offer a fair price to obtain supplies; otherwise the goods will be sold in the open market.

There is but one more use to

Industries (continued)

which the fruits produced in the Sturt Valley are put, and that is jam-making This industry may be either domestic or factory. Domestic jam-making is conducted in many of the homes of the Metropolitan area. The fruit is frequently bought through the markets from private dealers, or direct from the market. Factory jam making has the same difficulties and conditions as has factory fruit-preserving.

Now we come to the consideration of those industries resulting from the production of grapes and currants. There is but a small percentage of this crop consumed as fruit in Adelaide. Other than for table purposes, grapes are ~~grown~~ either crushed for wine, \and/ distilled for brandy, or dried for currants raisins or sultanas. Wine is simply the fermented juice of squashed grapes, and the numerous kinds of wines originate from the kind of grapes, or the proportion of the different kinds of grapes, which are crushed and fermented. Red wines

Industries (continued)

are made from grapes of which the greater number are red or black such as Matarah and Shiraz. Brandy is the distilled product of wine.

The raisin, sultana, and currant drying industries take a fair proportion of the crop grown. There is a continuous demand in the populated areas of South Australia for these commodities for cakes, buns, puddings and such foods. The wine-making cellars, the distilleries, and the drying sheds are naturally owned and conducted by the vigneron. Dairying and consequent industries are important, to some extent, all through the valley, because of the custom of individual land-owners to keep a cow or two on their orchards. Then on the flats there are large scale dairy farms which cater for a large amount of the suburban milk supply. There is also a large amount of butter and cheese made and these commodities

Industries (continued)

have a ready market anywhere. In connection with the ~~milk~~ \cream/ and dairying industries, pigs and usually kept and fed on the waste separated milk after the cream has been extracted. Thus a valuable and easily marketed commodity is raised very cheaply. At Coromandel Valley, too, pigs are kept, and they are fed on fruit which is not fit for market—bruised and partly rotten apples, oranges etc.

Poultry raising is a domestic industry of the Sturt River Valley. Nearly every homestead has its fowls, ducks, geese or turkeys—mostly fowls. They are fed, as well as on grain, on fruit and vegetables unfit for market, in cultivated parts. Hens are also invaluable to an orchardist because they eat the grubs and lice, which spoil the trees and fruit. Also by their continual scratching they help to keep the earth around the trees, soft. In this way they more than justify their claims for being kept, while the

Industries (continued)

eggs they lay are often a valuable supplement to the orchardists' income. Poultry are kept in the residential areas mainly for their eggs and for table purposes, and they are fed on purchased wheat or on mesh.

There is but one more derivative industry carried on in the area in which we are concerned, and that is fishing. Along the sea coast and in the Patawalonga, there are quite a number of salmon, mullet, and other less important fish. These provide a means of livelihood for a number of fisherman, and also good sport for hundreds of people. In the river Sturt itself there are a small number of fish but these are not sufficient to encourage fishing to any extent.

In considering the occupations of the people of the Sturt Valley one must not overlook the providers for the primary producers General Shop keepers and grocers flourish in large numbers through out

Industries (continued)

the area and they cater for the general wants of the people. They supply a large amount of the food and other requirements of the people. Then there are butchers and bakers, both indispensable in any populated region, who supply the principal foods—the meat and bread of the people. Then there are a number of specialised shopkeepers in the more thickly populated regions, such as drapers, news-agents, green-grocers, cake-shops, and confectioners.

Lastly we must consider a very considerable industry through-out the valley. Motor garages and agencies are now considered indispensable. These men supply the motors for the people and cater for their wants in respect of repairs, spare parts, petrols, oils, and in other ways. Along the greatly used highways such as the Main South Road there are a very large number of petrol bowzers, free air services, and oil bowzers to supply needy motorists with their requirements.

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Chapter VIII

Transport Communications & marketing. [Date stamp] 30 OCT 1928

The main means of transport in the Sturt River Valley are by road and by rail and to a small extent, by water. Roads of the Valley show how the ease of communication in the flat areas by their large number and their general straightness. In the mountain regions made roads over selected gradients are practically essential for regular traffic, but on the plains, numerous less well-made tracks and roads are prevalent. The reasons for this are obvious. The need of a hard well-made road in the hills is paramount, so that the wheels of the transporting conveyance may have the greatest possible resistance and so enable the great possible ease of transportation. On the level ground however, there is no such great need for an even hard surface, and so we may note that only the more important roads are well made. The Main south Road and the Bay Road

[Following page: Hand drawn map with heading]

Main Roads and Railways of the Sturt River Valley

Transport, Communications and Marketing (cont.)

are of bitumen. The side roads at Ascot Park and Oaklands, though the area is considered suburban, are, in winter little better than bogs. They are mostly unmettled, and as the soil is a red clay and the land so flat that the water tends to lie there and to soak in.

The two most important roads in the Sturt River district of the Adelaide Plains, are the Main South Road—which leads to Victor Harbour via Willunga, and the Bay Road which leads to Glenelg. They are made of Bitumen, a hard rubber like composition. This bitumen is placed on the road in a liquid form at a heat of over 200°, over a foundation of road-metal—quartzite. This costs thousands of pounds per mile and when it is set it presents a hard even surface. Such a road is estimated to last forty years.

The Main South road is one of

[Following page: Photograph with caption]

[Date stamp] -1 JUN 1928

The Main South Road in the centre and right of the snap, passing through the prosperous Sturt Valley

Transport, Communications, & Marketing (continued.)

the most important highways through the Sturt River Valley. It is a means of transportation and communication between Adelaide and the prosperous southern areas which produce wheat, wine, fruit and wool in such quantities. Also the South Road is socially most important and at week ends one may see a continuous stream of cars of pleasure-seekers on it. Many of these cars go to Port Noarlunga, Moana, and Victor Harbour, and yet some go the beautiful “scrub” lands of Willunga Hill.

From Adelaide to south of Sturt and Marion, the South Road runs over the Adelaide plains, and then it ascends Tapley's Hill. The road, when going up the hill winds around so as to gain as gradual a gradient as possible. The top of Tapley's Hill is on the edge of the Sturt Valley. The Bay Road, however is entirely on the Adelaide Plains and thus there are no

[Following page: Photograph with caption]

[Date stamp] 15 AUG 1928

The Bay Road to Glenelg.

Transport, Communications and Marketing (cont.^d)

hills to ascend. The road is practically straight and level. This road, in Summer especially, is carries many commercial vehicles and pleasure cars.

There are three railroad lines in the Adelaide Plains in the Sturt valley. They are the two Glenelg lines, one from North Terrace and one from South Terrace, and the Brighton–Willunga line. These are very important, both as a means of passenger and goods transportation. The Glenelg lines are most important for the passenger traffic they carry—businessmen who live in the suburbs and other workmen form the chief passengers.

Recently the Government have decided to electrify the Glenelg railway lines by having the Railways and Tramways to co-operate. It will, however, be some time before the change has been effected, but Pengelleys, the carpenters at Edwardstown, have received the contracts for the cars and are starting work on them immediately.

Transport, Communications, and Marketing (cont.^d)

Because of the presence of the flat bitumen Bay Road, the railways have little goods traffic. It has been found more economically to use lorry transport.

The Willunga line is really two routes—to Marino and to Willunga. The train which goes to Marino is most important for its passenger traffic which is made \up/ of business men and women who reside in Brighton, Marion, Oaklands, Ascot Park, and other smaller suburbs between Brighton and Adelaide. Goods traffic here, too, is not very important because of the ease of land-road transport. On the Willunga line itself, it is just the opposite. It is the goods traffic which greatly exceeds the passenger services. There is a large amount of produce which cannot be transported so easily and cheaply by road—cattle, sheep, wine, wheat, etcetera.

Facilities of transport in the highlands of the Sturt valley are very different

Transport, Communications, & Marketing (continued)

from the facilities we have considered, in the plainlands. The contour of the region is the deciding and arbitrary factor. Everywhere there is the one aim—ease of transport and to gain the least possible gradient. There are few roads in the highlands as compared with the plains. Where there is a young river valley the building of roads is most difficult. In such an area the roads are made on the ridges between the valleys e.g. the road from Blackwood to Eden and Shepherd's Hill, and the road from Upper Sturt to Coromandel Valley. This is the line of least resistance.

In "mature" river valleys road transport is along the base of the valley near the river itself. The roads from Upper Sturt to Stirling, and the road at Coromandel Valleys are good examples of this. The most important road in the highlands is

Transport, Communications & Marketing (continued)

the "Princes Highway" which connect Adelaide with the South East, and the Eastern States. This passes through Glen Osmond, Stirling and Algate. The Belair Hill Coromandel Valley Road connects the ~~Coromandel~~ Meadows, Bugle Ranges, Goolwa, and Victor Harbour with the city. There is but one railway line through the highlands of the Sturt Valley. This line goes around the side of Belair Hill and ascends the slopes in mighty turns and curves, and through a number of tunnels and cuttings which facilitate its ascent. From Eden to Blackwood, and thence to Belair, the National Park, Upper and Mount Lofty, the line clings to the ridge on the crest of the highlands.

This line is the most important in South Australia, as it is the one line over the Mount Lofty ranges and

[Following page: Photograph with caption]

[Date stamp] 18 AUG 1928

The Minnow Creek west of National Park, dammed back to gain water supplies for the "hill's line" locomotives.

Transport, Communications & Marketing (continued.)

connects the south, South-east, Murray lands, and Victoria with Adelaide. Both passengers and goods are most important—the latter are of paramount importance. Much of the produce of the Murray areas and the south-east (Mt Gambier etc.) is brought to Adelaide for sale and shipment.

The telephone service of the Sturt River Valley is both efficient and popular. It has become almost a ~~necessary~~ \necessity/ to many of the people in the district. The private producer finds it necessary in communicating with customers and with neighbours. The resident in the suburban area finds he needs a 'phone both for business and for social reasons.

Wireless, too, is becoming a popular means of entertainment and source of information in the valley. Thus by easy means of transport and communications we may see how the people reap the benefits of modern economic

Transport, Communications, and Marketing (cont^d.)

organisations and find that they are necessary for their general welfare.

Marketing is very important to the welfare of industry in the Sturt River Valley. The most of the residents who are engaged in industry, are engaged in the production of fruits and vegetables, to help supply the demand in Adelaide and its suburbs, and to some extent, for export. Hence there arises a need for some central exchange to which producers may bring their produce to sell to retailers, who sell in the local market, and to "packers" who send it to various country centres and even abroad.

The only wholesale produce market in Adelaide is the "East-end" Market on East terrace. This is a scene of great activity every Monday, Wednesday, and Friday fr morning from, on ordinary days 6.30 to about ten o'clock. In the busiest season, however, about Christmas time, the market some-

Transport, Communications & Marketing (continued)

There is an alternative market for some of the fruits and vegetables produced in the valley. This is at the factories. Apricots, plums, peaches, and figs are wanted for jam-making; tomatoes and plums for sauce; onions and gherkins for pickling; and apricots, peaches, and pears for preserving. None of these factories are situated in the Sturt River Valley. Among them are Jones I. X. L. Proprietary Coy and Rosella Combine. There is also a South Australian Fruitgrowers Coopertive Jam and Preserving factory.

In one or two cases, perhaps, producers of the Sturt Valley run a retailers van or shop so as to gain the profits of the so-called "middleman," or perhaps they may run hand in hand with some retailer. Such cases, however, are isolated, for most producers find it more profitable to keep strictly to production and to

Transport, Communications, & Marketing (continued.)

take their fruit and vegetables to market for sale.

[Following page: Photograph with caption]

The Glenelg Memorial Town Hall near the foreshore

[Date stamp] 15 AUG 1928

Chapter IX

The Social Organisation *[Date stamp]* 5 NOV 1928

The Sturt River Valley is very near the metropolis and in some parts it has almost as high a standard of social organisation as has Adelaide. Then again there are parts where the social

standards and organisation are much below those of urban areas. These comparatively unaccessible places are in the mountains and are capable of producing only a meagre population.

Glenelg, Morphettville, Ascot Park, Marion, and Brighton are all suburban in character and in social life. Glenelg and Brighton are so thickly populated as to be termed towns and to be locally governed by Corporations. They support large business populations who, many of them, go to and from their occupations in the city, morning and evening. Conveniences for social gatherings, churches, dance halls, and such social institutions are distributed fairly closely throughout these areas. Quite a number of people find it convenient

[Following page: Photograph with caption]

[Date stamp] 15 AUG 1928

A snap of Glenelg looking eastward showing the hills in the background.

The Social Organisation (continued)

to travel to the city for entertainment, for the journeys from Brighton to Adelaide and from Glenelg to Adelaide take less than half-an-hour, and the train fares are cheap and the service regular. The people of these areas are most cosmopolitan in spirit.

However, as one leaves the Adelaide Plains for the hills, the social atmosphere changes considerably, and the cosmopolitan spirit dies away. Because of the comparative difficulty of communication and sparseness of population, conditions are much more countrylike. The population centres are all small town-ships, with, at the most, a few hundred inhabitants. Blackwood, Belair, Coromandel Valley, Upper Sturt, and Cherry Gardens are the principal social centres of the highlands. The homes in this area are generally well-built, though perhaps not so artistically as those in the plains, for utility comes before beauty in such an

[Following page: Photograph with heading]

An Homestead at Sturt (in the centre background of the "snap") surrounded by an orchard.

[Date stamp] -1 JUN 1928

The Social Life Organisation (continued)

area. Many of the homes not actually in the townships are surrounded by orchards or by vegetable gardens. They are homesteads and have truly rural appearances. There is a considerable number of churches of various denominations throughout the \highland/ area, but they are small and not so well built nor are they such gems of architecture and artistry as are those of the lower areas. There is however, a larger number of churches in comparison to the population, in the hills, than in the plains.

Each township has its institute or Memorial Hall, in which picture-shows, dances, public meetings, fêtes and such social functions are held are held, generally at long intervals. Such institutes are the sole public places of entertainment and the social centre of the village.

Village stores of which each township possesses one or two or perhaps three, are

The Social Organisation (continued.)

~~are~~ also of social importance apart from their business transactions. They are the centres of news, and are also agencies for various banking, insurance and other such companies.

There is, in the highlands one or two bank branch offices at such places as are natural centres such as Blackwood and Coromandel Valley. Most of the banking transactions, however, are conducted through the General Store and the Post Office. Every post office is an agency of the Commonwealth Bank of Australia.

The plainland areas possess, however, large sub-offices of city, Australian, and even foreign banks. Stores, too, have not the same social significance; they are merely business houses specializing in certain classes of commodities. Education is one of the most important of the social aspects of the Valley, and therefore we must give it its due consideration. There are two different means

The Social Organisation (continued.)

of educating in the area—free in State-owned and regulated schools, and colleges which are owned and regulated by private enterprise, and demand fees. The schools in the thickly populated Glenelg and Brighton are large and have big staffs, but those in the highlands are small and have but one or two teachers. There are more schools in the latter region in proportion to the population, than in the plains. There are such State-owned primary schools at Upper Sturt, Cherry Gardens, Belair, Coromandel Valley, Sturt and Oaklands. Colleges are all large and well-staffed and draw pupils not only from the surrounding districts but from the city, and also from country areas. A few of the more important of them are “Woodlands” Girls College at Glenelg, “Sacred Heart College” for boys, at Glenelg, and “Ellesmere”, a preparatory school for boys at Blackwood. There are no High Schools in the Sturt Valley as the area is within easy

The Social Organisation (continued.)

access to the Unley and Adelaide High Schools, and for such scholars, the railways makes special concessions and the Education Dep^t allows such students free travel in many cases. The Sturt Valley is, on the whole, far more healthy as a residential area than is the city, and such thickly populated areas where dust, air impurities, and other unhealthy factors are present. The highland areas are most invigorating and so provide a refuge for weak and invalid persons, especially those with diseased and weak lungs. The Bedford Park consumptive home for soldiers is in the hills above Sturt and just south of the river. The foreshore, too, is most health-restoring and invigorating, and there are quite a number of sanatoria there, as well as it being a health resort. At North Brighton there is Minda Home for weak minded children and the Deaf, Dumb, and Blind Home. The healthy

The Social Organisation (continued.)

climate and situation probably is largely responsible for ~~its~~ their presence in this locality. The highlands and the foreshore are much frequented by picnickers and holiday-makers. Glenelg and Brighton are very attractive beaches and their comparative short distance from Adelaide entices a considerable number of visitors. The beaches further south, Port Noarlunga, Moana, and Victor Harbour, are becoming great rivals, now that motor vehicles are so common.

The National Park, South Australia’s biggest public reserve, is a very popular highland resort for picnickers and tourists. It comprises some acres, consisting of the hills at Belair and the beautiful Long Gully, covered with natural vegetation. The Long Gully, as previously explained, was formed the action of the Minnow Creek, a tributary of the Sturt. There are evidences that this creek was once much larger than it is now.

[Following page: Photograph with heading]

A Portion of Long Gully, showing the slopes covered with Natural Vegetation on either side.

[Date stamp] 18 AUG 1928

The Social Organisation (concluded)

The resorts of the Sturt Valley are visited by large numbers of interstate and international tourists. The beaches are a great magnet to them, but the highlands have a still greater interest. National Park, Upper Sturt, and Mount Lofty have quite a considerable tourist trade, and Stirling possesses several delightful and charming Guest homes and hotels which receive much patronage from tourists. The natural beauties of our State are only just becoming known in foreign countries and hence there have been, and will be, a steadily increasing flow of tourists through our beautiful Sturt River Valley.