NEW SOUTH WALES.

PHYSICAL GEOGRAPHY AND CLIMATE.

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Looking back through the pages of history, and the dim traditions of an earlier time, we find abundant evidence of a belief in the existence of a great south land to the south and east of what was then the well-known earth. Those early navigators whose travels had fostered this belief, had doubtless followed down the Malay Peninsula and the string of islands which seem to form part of it, in search of spices and other treasures which the islands supplied. Pliny, who had evidently gathered up the traditions of "Terra Australis incognita," says that it lay a long way south of the Equator, and in proof of this mentions the fact, strange in those days, that when some of its inhabitants were brought to civilization they were astonished to find the sun rise on their left hand instead of on their right. And Ptolemy, A.D. 170, after describing the Malay Peninsula, says: Beyond it to the south-east there was a great bay in which was found the most distant point of the earth; it is called "Cattigara," and is in latitude $8\frac{1}{2}^{\circ}$ south; thence (he goes on to say) the land turns to the west, and extends an immense distance until (as he believes) it joined Africa. Where these old determinations of latitude can be tested they are not grossly in error, and it may fairly be assumed that the latitude of Cattigara, and its situation in a great bay, is proof that it was some point in the Gulf of Carpentaria, for no other place would fulfil the conditions. The idea that the land actually reached Africa was not Ptolemy's; it was a necessary part of the system of Hipparchus, for he taught that the earth surrounded the water and prevented it from flowing away. It is not surprising therefore that the early navigators following down the islands came at length to that part of the Gulf of Carpentaria where the land turned to the west; and believing Hipparchus' system of geography, thought that in turning to the west they were in reality turning towards home,

and Cattigara was therefore the most distant point known. Marco Polo tells us that the Chinese navigators in his day (A.D. 1293) asserted there were thousands of islands in the sea to south of them, and in the present day we find proofs of their early visits to Australia in the traces of Chinese features amongst the natives of the northern coast. Indeed some historians think that Marco Polo, in the account he gives of the expedition sent to Persia by the Great Khan, refers directly to Australia, under the name of Lochac. This place he says was too far away to be subjugated by the Great Khan, and was seldom visited; but it yielded gold in surprising quantity, and amongst other wonders contained within it an immense lake or inland sea. It is impossible that such a description should apply, as has been thought, to the Malay Peninsula,—a country within easy reach, and one which his ships must have passed in every voyage; and so far from being beyond his power, it was within the limits over which his sway extended. That Lochac formed part of the mainland was also quite in accordance with their ideas of the earth, which surrounded the ocean, and the abundance of gold is certainly more likely to be true of Australia than of the Malay Peninsula.

For long years after Marco Polo we find no direct reference to Australia, except the stories which lived amongst navigators, and seemed to lose none of their marvellous points by transmission. These kept alive the desire to explore the great south land, so rich in treasures and wonders. All the evidence collected so far goes to prove that the Portuguese had early in the sixteenth century explored at least the northern parts of Australia. What they learned was however kept a profound secret until about 1540, when one of their government maps was stolen; and there are now in existence six maps believed to be copies of it, which were all published between 1539 and 1555; these all show Australia under the name of the "Land of Java," the real Java being called the "Little Java," and from this time onward frequent attempts were made to explore what had for so many generations been "Terra Australis incognita." Sturdy navigators could not understand the silence of the Portuguese, except as proof of the richness of the land, about which tradition told wonderful tales. "It was a land of gold and spices, of magnificent tropical fruits and vegetation, a perfect Paradise, in which the happy and simple inhabitants were loaded with jingling ornaments of gold. Its very atmosphere was elixir, and

existence a round of enjoyment." No wonder that in an age when, at least upon the ocean, the power to take was mistaken for the right to do so, there were many who cast longing glances towards the southern Paradise. Whether these stories of gold had any foundation in fact or not, when barter was regularly exchanged on the coast of Australia, it is impossible now to say, but more recent discoveries of rich surface gold lend some colour to them, and the vegetable richness of the northern part of Australia is quite in accordance with tradition. But all the early English navigators were unfortunate, and Australia got a reputation the very reverse of what further investigation has shown that it deserves. In point of fact, all the glowing colouring of tradition is true, but when Dampier, in 1688, sailed down the western coast, he saw nothing but a "dry sandy soil," and the "miserablest people in the world"; and later on, when the first English settlers landed on Australia, they chose a bay beautiful to look at, but there was no gold and no fruit worthy of the name, the soil was barren and sandy, and the climate in the worst part of its summer. No wonder that the fame of Australia was blackened, and report made it a miserable land, subject to droughts and floods, a land in which everything was turned topsy-turvy. The summer came at winter-time. Trees shed their bark, not their leaves—were brown instead of green; the stones were on the outside of the cherries; and the pears, pleasant to look at, were only to be cut with an axe, and there was nothing to eat, "unless, perchance, ye'l fill ye with root of fern or stalk of lily." Such was the early verdict upon Australia. Fortunately the first colonists once here were obliged to stop. By degrees they found that everything that was planted grew well; that wheat in the valley of the Hawkesbury yielded 40 to 50 bushels to the acre, and in one memorable season actually ruined the farmers by its very abundance, for in the then limited market, the price fell so low that it was not worth gathering, and it was left in the fields to rot, while the farmers sought other work. Horses, sheep, cattle, and pigs throve marvellously, and some of the cows getting away, the bush soon contained numbers of wild cattle: even wool did not deteriorate in the new Colony; and step by step the facts became too strong for prejudice, and the first fleeces of Australian sheep sent to England lifted the veil; manufacturers would take gladly as many as could be sent; their demand for more wool extends with the supply, and now only from Australia can they obtain the fine wools

which they need; quantity and quality of wool have increased together, and the Grand Prize at the Paris Exhibition for our New South Wales wool has proclaimed the fact far and wide. Wool has done still more for the Colony. We took possession of it as a narrow strip of coast country; the demand for pasture forced us to find a way over a hitherto impassable range, and the same want has driven all the desert out of the Colony, and covered it with thriving millions of sheep. The country which early writers upon Australia called a barren waterless desert, is now growing the finest wool and yielding abundant water, and when, in 1851, it was announced that gold had been discovered in abundance, the world was convinced that Australia was a promising country after all. Year by year the people have been coming in increasing numbers to supply our great want (population), and ever as the number increases new avenues of wealth and prosperity are opening to our view.

Geographically, Australia has a grand position, lying between the 10th and 40th degrees of south latitude, that happy mean where it is neither too hot nor too cold. Surrounded by the ocean, the sea breezes temper what might otherwise be a hot climate in the summer; the air is clear and dry, and yet brings rain in heavy showers. Vegetation is abundant, and includes all the cereals and fruits of the world, so that in the words of the old tradition it has all the conditions which make life a pleasure.

Australia measures from north to south 1,700 miles, and from east to west 2,400 miles, and speaking generally, has a rounded outline, the only great inlets on the coast-line being the Gulf of Carpentaria and the Australian bight. The total area is rather greater than that of the United States, and almost equal to the whole of Europe. On three sides and at a short distance from the coast are found ranges of mountains, of no great elevation, yet almost the only high land. On the west and north-west coasts the mountains form a bold outline of granite, rarely more than 200 miles from the coast, and attaining to heights of 2,000 to 3,000 feet. Between these and the sea the land is low and good, but on the inland side is found a vast table-land which slopes towards the unknown interior so gradually that the inclination is not easily seen, and no rivers running to the interior have yet been discovered—all known streams running to the sea.

On the east coast we have also the mountain chain parallel to the coast, but it is much higher and more extensive, and

the strip of low land by the coast is much narrower, often not more than 30 miles wide, and at Point Danger the range comes right to the sea. This grand chain of mountains is known generally as the Great Dividing Range, and extends for about 1,500 miles along the east coast. Near its southern extremity is the Snowy Range, the only spot in Australia where snow may always be found. The highest peak, Mount Kosciusko, 7,120 feet, is also the highest land in Australia; the ravines on its sides always contain snow, and the mountains near it, about 6,000 feet high, also are almost always covered with snow.

Of this great continent island the Colony of New South Wales holds the choicest portion—the southern part of the east coast—the part where with remarkable sagacity the first settlement was made. It has the best climate, all the most important rivers in Australia, the great bulk of the coal land, unlimited stores of all the useful minerals, and the finest pastoral and agricultural lands for extra-tropical vegetation; besides which, its extensive high-lands afford climatic conditions for all purposes. It is naturally divided into three portions; the comparatively narrow coast district, from 30 to 150 miles wide, abundantly watered by rivers and smaller streams coming down from the mountains. The rainfall here, fed by winds from the great Pacific Ocean, is very abundant, from 40 inches in the south to 70 in the north, and at Sydney 50 inches. The mountains have doubtless very much to do with this abundant precipitation, and at times the rains are so heavy that the rivers fed by mountain torrents carry heavy and dangerous floods. In years past wheat was largely and profitably grown, but rust has of late so frequently appeared that little or no wheat is grown, for it pays better to supply the city markets with dairy produce, indian corn, and the various kinds of hay. In the northern districts sugar-growing is a profitable industry and increasing rapidly. About Sydney enormous quantities of oranges are grown for exportation.

The second division includes the mountains and elevated plains, and extends the whole length of the Colony. An idea of the extent of this high land, measured east and west, will be got from the diagram herewith, showing a section from Sydney to Wilcannia. (Diagram No. 1.)

On the south, however, with the exception of the Monaro table-land, the country is very rough and mountainous, the highest points, Mount Kosciusko and the Snowy Range, catch

the rain and snow that feed the river Murray and the Murrumbidgee. Wheat grows well here, but nearly all the land is used for pastoral purposes. Proceeding northwards, the mountains decrease in height and extend laterally. Between Goulburn and Bathurst, the western waters form the Lachlan, and the eastern, the Hawkesbury Rivers. A part of the land is taken up for agriculture, some for mining. In its natural state the western country is open plain or lightly-timbered, and large areas are covered with rich volcanic soil which seems fit to grow anything, but the want of labour and carriage and the profit and security to be found in raising wool and meat, has for the most part tempted capital into squatting pursuits; but now that the Railway has reached this part of the country, no doubt more attention will be given to agriculture. From Bathurst northwards to the boundary of Queensland all the western waters go to form the various tributaries of the Darling River. These mountains are from 2,000 to 3,000 feet, with some peaks rising to nearly 6,000 feet. Here is found the Mudgee district, celebrated for its wools and its diamonds, and here also the greater part of the gold-mining area, as well as the mines for other minerals have been found. Coal is found on the western slopes, and also on the top in great abundance, with iron and coal, worked at Lithgow and other places; while deposits of copper, silver, lead, tin, and mercury are found in abundance, especially tin. A very large portion of the high land here is suitable for agriculture, and is being taken up for that purpose by degrees. English fruits—the apple, cherry, currant, &c.—grow to perfection here, as well as in other parts of the mountain districts.

The third division covers by far the greatest area, and consists of the Great Western Plains, extending away to the Darling River, and thence to the South Australian border. Here there are but few known mineral deposits, except copper, and no attempt at agriculture. All the land may be said to be held for grazing purposes, and for that purpose, now that capital has been invested in tanks and wells for water supply, this country is unequalled. Sheep and cattle thrive in a remarkable degree, and form a most profitable investment, the climate being dry and wonderfully healthy for man and beast.

These are the three great natural divisions, made so by the conformation of the land and the climate. It will be evident from what has been said of the elevation of the mountains that snow is not a common feature upon them, and the only

part where snow lies for any considerable time is the extreme south. As a necessary consequence, the river system is peculiar; indeed, it has often been asserted that Australia had no rivers, at least none which were of any use as such, but, as we shall presently see, this statement, like many others affecting Australia, was made in ignorance. After the necessity for increased pasture had driven the early colonists to cross the Great Dividing Range, aptly so-named, in search of pasture, in 1815, the desire to extend the new pastures beyond the Bathurst Plains, and to know what was to be found in the west, led on the explorers, and one of the first questions that demanded their attention was to account for the direction in which all the streams were flowing. The shortest road to the sea was to S.W., and yet all the water was running to N.W. Could there be a great inland sea into which these rivers discharged? In 1818 Oxley started with a determination to see where at least one of them went to; so he followed the Macquarie for more than 200 miles, and found that he was going due N.W. further and further, as it seemed to him, from the natural outlet on the south coast. At last the river spread out to an apparently interminable marsh. Turn which way he would, his progress was stopped by a shallow fresh-water sea, for sea he was at last convinced it must be, so great was its extent. He had got there after two very wet seasons (1817 and 1818), and his inland sea is now known as the Macquarie Marshes; and the mystery was not solved until Sturt, in 1829, found all these streams trending to N.W. unite in the Darling, and then turn to S.W., finally reaching the sea on the south coast.

Coming from mountains of such moderate elevation, these streams are necessarily dependent upon the rainfall, and have no snow to help them, so that in rainy seasons they become important rivers and in dry ones sink into insignificance; but since most of the rains which feed these waters are as it were offshoots of the tropical rains, they seldom fail altogether, and as a rule the Darling is navigable for a part of each year, and sometimes all through the year, up to and beyond Bourke; the current is very slow, seldom reaching 2 miles per hour, and therefore offers little hindrance to the steamers which carry wool and stores.

In the exploration of our rivers there was another surprise when settlement extended south-west from Sydney. The waters here were found to flow to the west, and the Lachlan

has for a considerable portion of its course a S.W. direction, that is at right-angles to the Macquarie and the Bogan. Could the Lachlan, the Murrumbidgee, and the snow-fed Murray ultimately join the waters that ran N.W. from Bathurst? Sturt had not solved this question—he only followed the Darling part of the way down—and it was left for Sir Thomas Mitchell to find the junction of the two river systems in 1835, and to prove that the Darling and the Murray were united at and below Wentworth. Of all these rivers the Murray is the largest and most permanent, fed as it is by the heavy rains and snow which fall on the high southern mountains.

It has a somewhat circuitous course, and is navigable as far as Albury, that is 1,703 miles from the sea. Of this, 1,116 miles are in New South Wales and 587 in South Australia. The Edwards and the Wakool tributaries of the Murray are together navigable for 400 miles, and the Murrumbidgee, another tributary, is navigable to Gundagai, 500 miles. The Darling is navigable for 1,758 miles from Wentworth, where it joins the Murray, to Walgett in the north, making in all 3,774 miles of inland navigable waters in this Colony, and making the navigable water in one line from Walgett to Wentworth 1,758 miles; thence to the sea 587, or in all 2,345 miles, so that the Darling stands third amongst the rivers of the world, estimated by their navigable length. (See diagram No. 2.)

It may be interesting to mention the length of some of the other tributaries. The Lachlan, from where it joins the Murray to its source, is 700 miles long; the Murrumbidgee, measured in the same way, is 1,350 miles long.

Tributaries of the Darling, measured from where they join the river to their sources:—

	Miles.
Macquarie	750
Namoi	600
Bogan	450
Gwydir	445
Mackintyre	350

Wide as is the country watered by these great arms, there are yet two large areas in which there is no surface water: the great triangular piece between the Bogan, Lachlan, and Darling, the high land in which turned the Bogan and others

to N.W., and the country west of the Darling, which is sufficiently undulating for rivers to form, were it not that the rainfall is so small and uncertain. Beyond all these, to the N.W., the Darling at one time must have been fed by very large tributaries bringing the water from tropical Queensland; the courses of several of these can still be traced to the Darling, but except in great floods they never contain water and cannot be now called tributaries. There are many unmistakeable proofs that the Darling was at one time subject to much greater floods. In addition to these now little used water-courses, the banks of the river are higher than the back country, and have evidently been made so by alluvial deposits, where floods never reach now.

In the diagram showing the comparison of rivers and mountains, the importance and length of the river Darling will be obvious, and the relative height of Kosciusko may also be seen.

THE COAST RIVERS,

beginning in the extreme north of the Colony, are as follows:—

1. *Tweed River* flows into the sea, just at the northern boundary of the Colony. It takes its rise at the foot of Mount Warning, 3,353 feet high, the most remarkable mountain on that part of the coast, and a well-known land-mark for sailors. Thence the river flows, in a north-east course, 30 miles to the sea. It is navigable for small craft only, owing to a bar entrance. The vegetation is rich and tropical. The rainfall is abundant, and the climate suitable for the growth of the sugar-cane and tropical fruits.

2. *The Richmond River* is a fine stream of water, taking its rise on the southern slopes of Mount Lindsay, the highest peak of the Macpherson Range. Its summit is 5,700 feet above the sea. Thence the river flows south-east through a rugged pastoral country, interspersed with patches of very rich soil, covered with valuable timber and tropical vegetation, and reaches the sea in 120 miles at Ballina Head. It drains an area of 2,400 square miles. It is navigable to Casino, 49 miles in one branch; and to Lismore, 65 miles in another branch. Cedar and other valuable timber is found in abundance. Much of the land is suitable for growing

sugar and other tropical products. Vessels and steamers trade from this river to Brisbane, Sydney, and Melbourne; the exports being sugar, corn, tallow, hides, &c., besides cedar and other timbers.

3. *The Clarence River* takes its rise in a woody range forming part of the Obelisk Mountains; flowing thence in a south-east direction 240 miles to the sea at Shoal Bay, in latitude 29° 26′. The Clarence is the largest river on the eastern coast of Australia, and drains an area of 8,000 square miles. For 70 miles from the entrance it is a magnificent stream, averaging half a mile wide, and is navigable for 136 miles to Solferino. The surrounding country is rich in minerals, pastoral country, and there are large areas of splendid agricultural land, on which sugar and corn are the principal crops.

Grafton, the see of a Bishop, and the principal town upon its banks, is 80 miles from the sea, and a regular line of steamers run thence to Sydney. There is a rich, thriving, and rapidly increasing population in this district.

Gold, copper, abundance of good coal, and other minerals are found here; and these, together with the agricultural and pastoral products, create a large and important trade in this well-known river.

The climate is very healthy, and in winter simply perfection; although rather warm in the summer it is not the enervating heat of the tropics. In summer the trade-wind frequently blows here for some time, and the rains, which are abundant, give rise to a tangled vegetation, the best index of the richness of the soil and climate.

For the sake of comparison it may be stated that the River Thames, in England, is 250 miles long, drains 6,000 square miles of country, and is navigable for 60 miles.

4. *Macleay River* rises in the northern table-land, near Ben Lomond. The two arms of the river are called Gyra and Apsley; the latter has cut a channel for itself in the mountains; its course is marked by a series of magnificent falls, the greatest being a perpendicular fall of 240 feet; thence a series of smaller falls let the river down through a narrow gorge more than 1,000 feet deep and only 600 feet wide at the top and a quarter of a mile long, which has all been cut out of hard sandstone. In other parts of its course

the water is 3,000 feet below the sides, which even here are only from 2 to 3 miles apart. The scenery is very grand and beautiful. After the junction of these branches the Macleay flows in an east and south-east course to the ocean at Trial Bay, north of Smoky Cape. The whole length of the Macleay is 200 miles, through a rugged and splendidly timbered country; it drains an area of 4,800 miles; it is navigable for small sea-going vessels for 30 miles. There is abundance of rich alluvial soil producing corn and sugar-cane freely.

5. *Hastings River* is a fine stream flowing into the sea in the large harbour of Port Macquarie, the town of Port Macquarie being situated on the south side of it, near the mouth. It flows for 70 miles through a rich undulating country, clothed with valuable timber, and having fine patches of alluvial soil; it drains an area of 1,400 square miles.

6. *Manning River* is a large stream rising in the main range near the town of Nundle, flowing in an easterly direction for 100 miles through a very rich agricultural and timber country; it drains an area of 3,000 square miles, and flows past Wingham, Taree, and Cundletown. It is navigable for sea-going steamers for 20 miles.

7. *Karuah River* rises in the Mount Royal Range, and flows through rich agricultural land 45 miles into the sea, or rather the head of Port Stephens, a magnificent harbour, 15 miles in length, and little inferior to Port Jackson; it drains an area of 600 square miles.

8. *Hunter River* is one of the most important in the Colony; it rises in the Liverpool Range, and runs in a south and east course 200 miles to Port Hunter or Newcastle. It drains 7,900 square miles, and it is navigable by large steamers for 35 miles. The Williams River, a tributary of the Hunter on the north side, is navigable for 20 miles to Clarencetown; and the Paterson, another tributary falling into the Hunter on the north side, is navigable for 18 miles to Paterson township.

The whole district of the Hunter is exceedingly rich in pastoral and agricultural products. The first grapes that gave renown to Australian wine were grown in this district, at Irrawang, and now grapes are grown in immense quantities, the soil being eminently suited to them. Tobacco also

is found to grow well; and on the wide extent of rich alluvial soil farming is carried on to great profit. There is an abundance of fine timber, but, as this is the oldest settled district next to the Hawkesbury, it is not now to be found close to navigation. Here also is situated the most extensive coal workings in the Colony; the majority of the pits are near Newcastle, but some are worked at various distances from the sea up to 30 miles inland, and the whole district is one great coal field, with many valuable seams one above the other. There is a very large export trade in coal from Newcastle to the neighbouring colonies and eastern seas, and the tonnage of vessels in the course of the year is greater even than Sydney. Government has provided abundant wharfage and crane accommodation for shipping the coal, and by judiciously confining the river the harbour is being gradually scoured deeper by the action of the tide and river water.

9. *Hawkesbury River* is one of the finest rivers on the east coast. It rises in the Culârin Range, and flows past Goulburn; thence through the wonderful sunk valley called Burragorang, until it is joined by the waters of the river Cox, on the west; it is then called the Warragamba, until it is joined by the Cowpasture River and other streams. Its name then changes to the Nepean, and it is a fine deep stream of water flowing still northerly past the important towns of Penrith and Richmond, where it is joined by the river Grose, a remarkable mountain torrent; and thence it is called the Hawkesbury, and flows past Windsor and many smaller towns to the sea, 140 miles distant. Soon after passing Windsor the northerly course is changed to easterly; thence to the sea. Its whole course is 330 miles long, and the lower 60 miles is through a rugged country with some magnificent scenery.

The different names by which the various portions of the same river are known were given by early explorers before it was known that they formed one fine river; it seems impossible now to alter them. The mouth of the Hawkesbury is a magnificent harbour, of the same general character as Port Jackson. Branches of it extend north to Brisbane Water for 10 miles, and south Pitt Water 8 miles. Round Brisbane Water is a fine agricultural district and abundance of coal. Passing up the river it is studded with thriving farms, and about Windsor and Richmond there are broad alluvial flats of

wonderfully rich soil, the first, and for many years the great, wheat district of the Colony. Recently corn and lucerne have been found more profitable. The river is navigable for vessels of considerable size as far as Windsor, 140 miles from the sea.

10. *Shoalhaven River* is the largest on the east side of the range south of Sydney. It rises in a swamp called Corombars, at an elevation of 2,800 feet, and flows north through the townships of Ballababa, Larbert, Nowra, Numba, and Terara, into the sea by a wide estuary at Greenwell Point. It is 260 miles in length, and drains 3,300 square miles. The upper portion flows through wild country and deep glens, overhung by mountains often 1,500 feet high. This part is highly auriferous, and well known to tourists as the Shoalhaven Gullies. The lower part flows through rich and low-lying agricultural and farm land. Owing to obstructions in the river, it is navigable for only 12 miles.

11. *Clyde River* is an important stream rising in the Pigeon-house Mountain, and flowing 70 miles in a southerly direction into the sea at Bateman's Bay. It drains 450 square miles of country. Rich in agricultural and dairy produce; and part of it is auriferous.

12. *Moruya River* rises near Araluen, and flows 80 miles south-east past the townships of Kiora and Moruya, into the sea by a wide estuary. This river drains 350 square miles, and is the only outlet by water of the rich auriferous districts of Araluen and Braidwood. In the lower districts are to be found magnificent alluvial flats, which produce abundant crops. The river abounds with fish and oysters. In the more rugged parts abundance of gold-bearing quartz and a very rich silver ore are found.

13. *Tuross River* rises in the lofty mountain known as Barren Jumbo, and flows in a general N.E. direction across rich pastoral and mineral country into the sea by a wide estuary; it drains about 600 square miles of country.

14. *Bega River* is a fine stream rising in the coast range, and flowing in a generally east direction for 60 miles to the sea, through a rich pastoral and agricultural country into the sea at Tathra; it drains 550 square miles and is navigable for a few miles. Coal and kerosene shale are found here, and

great quantities of cheese are made from the abundant pastures, one manufacturer, it is said, taking for cheese alone from £1,000 to £1,200 per month.

15. *Towamba River* is a fine stream rising on the eastern slopes of the coast range, and flowing 40 miles through a rich pastoral and agricultural district into Twofold Bay at Boydtown. Twofold Bay is 280 miles south from Sydney, and is the finest harbour on this part of the coast, and has near it the Dromedary Mountain, 2,700 feet high, as a conspicuous land-mark. Here is a fine lighthouse, 140 feet above the sea, and every natural convenience for a large sea-port, and at times numbers of cattle from the splendid district of Manaroo are shipped here for Tasmania and Melbourne.

16. *Snowy River* is a large stream with numerous tributaries; it takes its rise in the peak of the Muniong Range, called the Ram's Head. It flows through rugged and precipitous mountains for 240 miles in New South Wales, and then crosses the border into the Colony of Victoria, and there finds its way into the sea. With its tributaries, the total length of the river is 3,000 miles. Floods are very common, owing to the mountain rains and snow. The country is too rugged for agriculture, and is used for pasture and mining.

Neglecting many smaller streams and the parts of these rivers which could easily be made navigable by removing fallen trees, we have still in use 545 miles of navigable water in the coast rivers.

A notice of the river system would be incomplete without a few words about the water to be obtained by sinking. The western plains of this Colony are acknowledged to be the finest pastoral country in the world, with the one exception that they want permanent surface water. At first sight this seems a fatal objection, and the rich fattening grasses, the warm dry atmosphere, the freedom from disease, and the total absence of animal pests, seem of small moment beside the great question of water in a dry season. In all ordinary seasons there is plenty, but as no chain is stronger than its weakest part, the squatter feels that however abundant may be his store of grass, which a kindly sun without sickle or scythe has converted into hay, and which a perennially calm, or almost calm, atmosphere does not disturb, he dare not look a dry season in the face while he has full stock on the back blocks. Dams and other artificial surface supplies are well

if prepared and filled in a wet season, but if not, his only other chance of getting water is by sinking, and here fortunately experience is accumulating facts which seem to place it beyond all doubt that over a very large portion, if not the whole, of that flat country, abundance of good fresh water is to be found by sinking. In some cases when found the water overflows in an abundant stream, and in others it has to be raised, but so far as it has been tried the supply is sufficient for all requirements over the greater part of the plains; and with abundance of cattle for labour, very simple machinery will suffice to raise the water where necessary. Many doubts have been expressed about the quantity, and not a few fear the wells will run dry. In a recent paper, however, read before the Royal Society, it was shown by the Astronomer that the supply must be practically unlimited. The substance of his remarks may be of interest here.

Taking the River Darling as the only apparent drain of the great plain country and the western slopes, an area amounting altogether to considerably over 200,000 square miles, but which was taken as only 200,000 square miles, the average rainfall over this great district is 20 inches per annum; and assuming that only one tenth of this finds its way to the rivers, it was shown that the Darling, in order to carry off the water, must flow 200 feet wide and 100 feet deep all the year through. Now it never even in flood approaches such dimensions, and in summer sometimes stops running. The water therefore must to a large extent sink into the ground to flow at some lower level.

At present the available information about wells is not very extensive, but every fact brought to light points in this one direction, viz., that there is an unfailing supply below the surface.

With such facts before them, the holders of back blocks need fear no dry season, for with abundance of water to be got by sinking, the dryest season loses its worst terror. Indeed dry seasons like many other features of Australian history have been grossly exaggerated.

HARBOURS.

New South Wales has a coast line of 800 miles on which very little stormy weather is ever experienced, and almost the only dangerous storms are easterly gales which are very few and far between. In the early days, before the coast was

lighted, or the character of the harbours known, an easterly was to be dreaded, but now lights show the mariner where he is and lead him into shelter. Beginning on the south we have Twofold Bay in latitude 37°, 228 miles south of Sydney. This is a fine and spacious harbour which may be entered in all weathers, has a light-house on the north side, and must some day be the centre of a great trade, as it is the natural outlet for the rich agricultural and pastoral country known as Manero Plains. Mount Dromedary, 2,700 feet high and within 2 miles of the sea, forms a conspicuous land-mark for Twofold Bay.

Jervis Bay, in latitude 31° 6′ S., is a very fine harbour, 80 miles south of Sydney. The entrance is 2 miles wide, the harbour large enough for the navies of the world, to use a nautical phrase; has deep water right to the shore and good anchorage. It is in the midst of rich pastoral and agricultural lands, and at no great distance are extensive deposits of iron, coal, and lime, within a few yards of each other.

Botany Bay, the site selected for the first settlement, is a large harbour with good entrance and protection from the weather, but the water is very shallow.

Port Jackson.—Sydney Harbour has had so much said about its wonderful beauty that it is not necessary to repeat it here. Its numerous bays form a network of harbours difficult to describe, and the extent is perhaps best indicated by the fact that from head to head it has 200 miles of water frontage available for wharfage—a quantity not likely to be utilized for some years to come. It has the finest light on the coast, an electric arc light flashing every minute and visible 60 miles.

Broken Bay, 11 miles north of Sydney, is the mouth of the river Hawkesbury. Like Port Jackson, it is a harbour full of beautiful land-locked bays with deep water, and is much more extensive but not so available for city purposes as Sydney, for the fore-shores are generally high and precipitous, rising to 600 and even 700 feet. Its entrance is marked by a light-house.

Newcastle, the mouth of the river Hunter, is 60 miles north of Sydney. When discovered it was not safe in bad weather nor easy of access, but now an immense breakwater protects it from the sea and has caused the river to scour it

much deeper, so that it is a safe and commodious port, with a first class light-house, steamtugs, &c.; in fact, art has made it a good harbour and easy of access.

Port Stephens, the estuary of the Karuah River, is in latitude 32° 45′, is a beautiful and commodious harbour marked by a light-house, but at present it is not much used, there being very little trade.

Shoal Bay, the estuary of the river Clarence, is a fine harbour with abundance of safe anchorage in the river, although the size of the vessels entering is limited by the depth of water on the sand-bar—a drawback not yet wholly removed. The entrance is marked by a light-house.

Such then is the position of New South Wales geographically, and it is one from which the most enjoyable climate might be expected, because it is beyond the limits of tropical heat, and yet within the influence of offsets from the trade winds, which in summer blow upon the coast districts and make the temperature much lower than might be looked for in this latitude, and much lower than is experienced in corresponding latitudes in Europe.

Yet it is a fact that in works of reference Australia generally is credited with heat in excess of that due to its latitude. It is difficult to say why, unless it arose from a habit of one of our early explorers who carried a thermometer and carefully published all the high readings he got, until, fortunately for the Colony, the thermometer was broken and the unfair register stopped. But not only the interior, Sydney even to the present day is credited, in standard works of reference, with a mean temperature of 66·2°, or nearly four degrees higher than the true mean, which is 62·6°; such an error is not excusable when meteorological observations have been taken and published for just forty years. There is another error made by some writers when describing Australia. It is shown by them inverted on the corresponding latitudes in Europe, and the reader naturally infers that Australia is as hot as those parts of Europe. How far from the truth this is may be seen in "Table I," and in the remarks on temperature which follow, and in diagram 3. Confining our attention to New South Wales, that is between 29° and 37° of south latitude, we find that generally it is cooler than a corresponding part of Europe. The mean temperature of the southern parts of England is

about 52°, and that of France, near Paris, about the same, increasing as you go south to 58·5° at Marseilles. Taking this as a sample of the best part of Europe, let us see how the mean temperatures in the Colony compare with those: Kiandra, our coldest township, situated on a mountain, is 45°; Cooma, on the highland, 52°; Queanbeyan, high land, 53°; Goulburn, high land, 55°; Armidale and New England district, 57°; Mossvale, 55°; Kurrajong, 55°; Orange, 55°. These towns are scattered along the high table-lands from south to north, and represent fairly the climate of a very considerable portion of the whole Colony. Next to this in point of temperature is the strip of land between the ocean and the mountains, and which is affected by the cooling sea-breezes. Here we have a mean temperature ranging from 60° at Eden, the most southern port, to 68° at Grafton, one of the northern ports. Sydney, in latitude 34°, has a summer temperature only four degrees warmer than Paris, which is in latitude 49°. Now the usual difference for a degree in latitude is a degree in temperature, and, therefore, if Sydney were as much warmer than Paris as its latitude alone would lead us to expect, its temperature should be 74°, that is 15° warmer than Paris, but, as we have seen, it is only 4° warmer. This single example is enough to prove the comparative coolness of our coast districts. The investigation made during recent years shows that the mean temperature of the whole Colony, as derived from forty-five stations scattered over it, is 59·5°, three degrees lower than that of Sydney, or only one degree hotter than that of Paris.

It may be mentioned that the highest shade temperature ever recorded in Sydney was 106·9°, and near Paris a temperature of 106·5° has been recorded.

The third great district, consisting of lower land and plains to the west of the mountains, has a climate considerably warmer in summer than the parts above described, owing to the powerful effect of the sun on land having little forest and little or no wind; but in winter the temperature sinks down much lower than the coast districts, owing to the great radiation; so that the annual mean temperature is not so great as the summer heats would lead one to anticipate. Table I has been prepared for the purpose of showing by comparison with many places in Europe and America the temperature of the Colony. Northern stations are printed in Italic and southern ones in Roman type. It will be seen

that the places have been arranged in order of temperature, taking for that purpose the mean annual temperature. A glance at this shows at once that the range of temperature here is equivalent to that offered by Europe from the south of England through France to Sicily. (See map of Europe herewith.) Such a range is more remarkable, because if New South Wales were placed on the map of Europe according to its latitude it would extend from Sicily to Cairo, whereas when placed by its temperature it stretches as we have seen from Sicily northwards to England. Nor is this all that the table shows us. For even when we find a place in Europe with a temperature equal to that of some place here, it is at once observed that the summer temperature in Europe is warmer than the Colonial one and the winter colder; for instance, Naples, 60·3°; Eden, 60·3°; summer at Naples, 74·4°; at Eden, 67·7°; winter at Naples, 47·6°; Eden, 51·1°; and so generally the southern country has the cooler and more uniform temperature. It is worthy of remark that the only places here of equal mean and summer temperature with places in Europe are those which are to be found on the western plains, as at Wagga Wagga, which has a mean temperature of 60·3°; Naples, 60·3°; and summer temperature of both is 74°; or again, to compare the places of the same or nearly the same latitude, Messina, in Sicily, latitude 38° 11′, has a mean temperature of 66°, summer 77·2°, winter 55°; Eden, New South Wales, in latitude 37°, has a mean temperature of 60°, summer 74·4°, winter 51·1°; or Cairo, in latitude 30°, mean of 72°, summer 84·5°, winter 58·5°; Grafton, latitude 29° 45′, mean 68°, summer 82°, winter 56·3°. It is useless to multiply examples,—we have here enough to show how much cooler Australia really is than the fervid imaginations of some writers have made it appear in print.

Looking at this question of temperature generally, it will be seen that New South Wales is no exception to the general deduction of science that the southern lands are cooler than those of corresponding latitudes in the north, and it is only during hot winds, which are very rare in New South Wales, that the temperature rises to extremes. But to leave Europe, and compare the climate of New South Wales with that of America. Our limits of latitude would place us from Washington to New Orleans. Now the mean temperature at Washington is 55° and at New Orleans 68°, while that of

Eden is 60·3° and Grafton 68°, so that if mean temperature were a complete test of climate it would appear that our coast is hotter than corresponding latitudes in America. But mean temperature is not enough: we must compare the summer and winter temperatures; and summer at Washington rises to 76·7° and at Eden only to 67·7°, 9° cooler; New Orleans summer is 82° and Grafton 77·2°, but 82° hardly represents the summer heat at New Orleans, for it is a steady broil, during which every day for three months of summer the heat is over 80°, a temperature that is only reached on this coast during hot winds, or in other words, very seldom. But winter temperature at Washington falls to 37·8° and at New Orleans to 53°, at Eden 53·2°, and at Grafton 56°. Hence it is evident that on this coast the heat is very much less in summer and greater in winter than upon the coast of America. Tables I and II are given as an extension of this comparison, and, taken with the map, show in the most concise way the character of our climate. Tables III and IV give the meteorological conditions for Sydney. Such facts place the Colony in a very different position in regard to climate from that which it has occupied in published works, for instead of being a hot country we see that its coast districts are much cooler than corresponding latitudes in Europe and America, and that in its elevated districts, which comprise a large part of it and much of the best land, it has a climate no warmer than the best and most enjoyable parts of Europe in much higher latitudes; but while bringing these facts into due prominence it is not the intention to deny that another considerable part of the Colony, forming the western plains, is subject to greater heat, caused, no doubt, by the sun's great power on treeless plains, and the almost total absence of cooling winds, yet, although in summer, the temperature here frequently rises over 100°, and sometimes up to 120°, yet, owing to the cold at night and in winter, the mean temperatures are not greater than those of corresponding latitudes in the northern hemisphere; and this part of the Colony being remarkably dry, the great heat is by no means so enervating as a temperature of 80° in the moist atmosphere of the coast, and, what is of still more importance, it does not produce those terrible diseases which are usually the offspring of hot countries. This is also, no doubt, due to the dryness of the air. Stock of all kinds thrive remarkably well, and are very free from disease in those hot western districts.

RAINFALL.

The rainfall along the coast districts is very abundant, ranging from 45 inches at Eden to 70 at the Tweed River in the extreme north. At Sydney it is 50 inches. Along the top of the mountains the rainfall is from 30 to 40 inches, on the western slopes from 20 to 30 inches, and over the flat country from 10 to 20 inches.

The coast rains are often tropical in their character, and deposit water in such abundance on the face of the mountains as to feed many rivers, the more important of which have been mentioned; but these rains on the abrupt rise of the mountains run down so rapidly that floods frequently result, and are now and then dangerous; years often pass, however, between two such visitations, and the fact that houses are frequently built on lands subject to them shows that they are not much dreaded.

The coast and mountain rains come from the eastward. The clouds coming in from the sea at a small altitude, deposit abundant rains as they travel over the mountains, for as they rise in obedience to well known laws they drop nearly the whole of their rain, and then having passed over, they become gradually as they descend dry clouds over the western plains; but when the force of the easterly current is over, and these clouds become subject to the usual drift from west to east, they have again to rise over the mountains, and in doing so deposit moisture; hence it is that the western districts get a great deal of rain with westerly winds. In the northern districts tropical rains sometimes come from north-west or north-east.

Speaking generally, the rain in New South Wales is heavy rain compared with that of England, that is when falling much more falls per hour here than there; Sydney in 152 days has 50·05 inches rain, while London with 146 days has only 24·76 inches rain.

So also with regard to dry intervals, forty years' experience in Sydney has never furnished one month entirely without rain, but in dry periods, several months sometimes pass consecutively, during which the fall is too small for water supply; and of England exactly the same remark has been made; no complete month has ever been without rain, but at times several months are consecutive, during which no rain available for water supply falls.

DROUGHTS.

There is a good deal of misapprehension about droughts, and it is a common thing to speak of them as if they were phenomena peculiar to Australia, when the fact is that all countries are subject to droughts or temporary short rainfall, and some countries which have never been credited with a drought are by no means free from them. For instance, England is frequently subject to drought, not simply for a month or two, but for several years in succession. The rainfall of 1854 was only 75 per cent. of the average; 1855, '56, '57, were all below the average; and 1858 was only 80 per cent. of average; 1863 and 1864 were both very much below the average. Going further back, four consecutive years may be found in which the rainfall in no year exceeded 65 per cent. of the average. No such drought has ever yet been recorded in Australia. In Sydney with forty years' experience the lowest rainfall of any year (1849) has been 44 per cent. of the average, and the smallest rainfall for two consecutive years yet gave 74 per cent. of the average for each year. Whence then it may be asked is the difference, for it must be admitted that their effects are greater here than in England? In the first place, the high state of cultivation there tends to preserve the moisture in the soil, and in the next place, the heating effect of the sun is not by any means so great as it is in Australia; and thirdly, the abundant supplies from other countries tend to mitigate the effect of a drought. But in Australia cultivation has not yet mitigated to any considerable extent the effects of drought, and a bright sky gives the sun terrible power over the water, which so far man has taken little care to conserve; and lastly, in the early days of the Colony when the glowing accounts of droughts were written, if supplies could not be grown the nearest neighbour from which supplies could be got was the Cape of Good Hope, and such difficulty in getting supplies naturally magnified the terrors of droughts; but gradually and satisfactorily this state of things is passing, or has passed away. A drought does not involve all the Australian Colonies at once, and the need of one is supplied by the abundance of others, so that to man droughts have lost their terror, and it is only to the pastoral interests that they retain some of their old power; even here, however, the effort to conserve water, and also to obtain it from wells, is having a decided effect for the better. As a rule also droughts cover a comparatively limited area, seldom or never involving the whole even of this

Colony at once, and it is a common thing to move the stock to the favoured district till the time of trial is over; and it is an acknowledged fact that were stock judiciously limited on runs the losses by drought would be comparatively trifling, but the superabundance of grass and water, which are the rule, tempt the squatters to overstock the runs, and when a drought does come the losses are severe.

Such appears to be a fair but condensed statement of the facts about droughts. Of course for a ready pen the subject is a tempting one,—it is an easy one for word painting, and unfortunately the colours are generally too bright, and ready made "under hot and copper sky," a lurid light "upon an awful scene of death and desolation." Their "sun rises on a hazy morning, sails in a white heat through a cloudless sky and sets a round red ball of fire," &c., &c. Serious as a drought is at any time, the impression conveyed by such writing is very untrue, and sets the imagination to work upon false information.

WINDS.

It is difficult to give in a short space a clear account of our winds, because, living on the margin of the trades and subject to the uncertainties which such a latitude brings, we have, as a rule, variable winds; there are, however, some marked features which belong to our position, and we will attempt to trace these.

A general view of our wind *causes* may help to a clearer knowledge of the effects, and it will facilitate this if we look first at what we know would follow if water flowed over the whole of the Australian continent; the trade wind would then blow steadily over the northern portions from the S.E., and above it the like steady return current would blow to the S.E., while the "brave west winds," and southerly would hold sway over the other half,—conditions which now exist a short distance from the coast. Into this system Australia introduces an enormous disturbing element, of which the great interior plains, and the main chain of mountains running along the east coast, form the most active agencies in changing the directions of the wind currents. The former, almost treeless and waterless, acts in summer like a great oven with more than tropical heating power, and becomes the great motor force on our winds, by causing an uprush, and consequent inrush on all sides, especially on the N.W., where it has power sufficient to draw the N.E. trade over the

equator, and into a N.W. monsoon, in this way wholly obliterating the S.E. trade belonging to the region, and bringing the monsoon with full force on to Australia, where, being warmed, and receiving fresh masses of heated air, it rises and forms part of the great return current from the equator to the south.

That there is a constant, overhead current may be traced day after day and month after month, by the small clouds which mark its lower limit, passing in ceaseless streams to S.E. On the south coast the sea-breezes are drawn in by the same force, and help to feed the inland demand for uprushing wind; on the east coast there is a similar inrushing tendency. Here, however, we have the mountain chain to modify the direction of these currents setting in to central Australia, and to a great extent it limits the sea-breeze, which seldom gets past this barrier, and only reaches the eastern sides of it late in the day. Partly by the direction of the mountains, and partly by the friction of the N.W. wind overhead, the sea-breeze is usually deflected from its easterly or south-easterly direction to north-easterly, where it blows with fine weather and a high barometer, with a low barometer at and about this latitude, the north-westerly or southerly currents rush in as the depression passes to the eastward, the barometer rising all the time, and getting high as the wind reaches S.E. Here the gale usually dies out, and fine weather brings the sea-breeze again; but in winter such a gale sometimes backs to the westward, and, contrary to ordinary experience and our summer experience, the gale clears up at S.W. or W. In favourable seasons the wind veers nominally from N.E. through N., W., and S., but the change practically is from N.E. or northerly to S. at once, and we feel but little of the N.W. wind.

With the southerly wind the barometer rises, and when the void is filled the north-easters and fine weather return, until a like disturbance takes place. The barometer usually falls for some five or six days before a north-westerly wind, but sometimes the fall only lasts one or two. The duration of the north-west wind also is very variable, but in the great majority of cases it is displaced by the southerly winds within twenty-four hours. It is interesting to inquire the thickness of the wind currents which blow under the great north-westerly stream, and though the facts are few they have great significance. That these cool currents are of no great thickness is evident, for at times it is possible in Sydney to

fly a kite so that it rises through the N.E. and is carried away by the N.W. current. The Rev. W. B. Clarke has shown that the N.E. is only about 5,000 feet thick. I have myself observed, when going up the mountains from Penrith, on a cloudy but otherwise fine morning, that when we got to an elevation of 2,400 feet, clouds appeared in the trees, and soon after we encountered tremendous showers of rain, which continued at intervals nearly to 3,400 feet, when we had evidently passed through the clouds, and I afterwards ascertained that at Sydney a steady N.E. wind was blowing under an overcast sky. On inquiry the engine-driver told me it was a common thing to meet rain and clouds on the line about the same place.

At the Kurrajong I have seen a southerly come on, and the clouds strike the hills at 1,500 feet. In Van Diemen's Land Strzelecki found the hot wind at an elevation of 5,000 feet, and it was not felt on the same mountain at an elevation of 3,000 feet.

From observations made on the small cumulus clouds which so often mark the lower limit of the N.W. wind, I find that they travel from the western to the eastern horizon in from one and a half to two hours. If the altitude of these clouds is taken at only 4,000 feet, which they would have to be to clear the mountains, and which from Strzelecki's and Rev. W. B. Clarke's observations would appear to be a small estimate, the velocity up above must be 80 miles per hour, while on the surface, when this wind is felt, it seldom reaches a velocity of 40 miles; and these facts pointing to a probable thickness of about 4,000 feet for the N.E. wind, accord well with the thickness (9,000 feet) of the trade at Teneriffe, where it is in full force, while we are on its margin. That the N.E. winds are deflected trade winds is evident, because going north, along the coast, the direction changes to S.E.; and this is a frequent wind at Port Macquarie and northwards. Even at Sydney, as in January, 1871, the trade wind cloud is sometimes unmistakeable.

In winter, the great heating influence of central Australia is gone, and its effect is then to cool by its great radiation the westerly winds that blow over it; and as the trades move northwards, westerly winds prevail, and storms and rain from south.

The results in table IV, derived from nine years continuous records of the anemometer, give a much better idea of the distribution of the winds than any general description. The

records have been distributed into the four seasons. Taking the summer—December, January, and February—the great prevalence of southerly and easterly winds compared with westerly is shown by the numbers 105 S. 95 E.N.E., and only 27 W. In autumn—March, April, May—however, things are changed, and chiefly by the great prevalence of westerly wind in May; the average westerly prevalence is now 112, as compared with 59 S. and 32 E.; and in winter—June, July, and August—the westerly hold still more decided sway, for we have 191 westerly, only 23 S. and 11 E.: and in spring—September, October, November—we have a general distribution of wind all round the compass; W. has a slight preponderance, being 78, compared with 67 S. and 46 E., or rather 73 N.E., which is then the prevailing easterly direction.

Generally it may be said that inland the prevailing winds are from N. and W.

In Sydney, from October to March, with barometer at 30 in., we have fresh N.E. winds during the day; they generally begin between 8 and 10 a.m. in the forenoon, and gradually increase to their maximum about 4 p.m., and die away about sunset; occasionally they last till 10 or 11 p.m., and in some cases all night, continuing day and night for several days, constituting a "black north-easter"; the barometer then falls rapidly for one or more days, and the wind changes to the opposite quarter, S.W. If N.E. wind is very strong, the change to S.W. will be all the more sudden, and it will blow hard from that quarter also; rain in some cases follows after a day or two of the S.W. wind. These gales occur nearly always in January, but occasionally in December, and the force is greatest late in the afternoon and early part of the night.

When the wind is N.E. and the barometer falls gradually it will veer to N.N.W. and W., where it will blow for one or more days; as the barometer rises it will veer to S. and die at S.E. or E., with high barometer; to begin another circle from N.E.

If in fine hot N.E. weather the barometer falls fast in the forenoon, a southerly wind (burster) may be expected before night; if the day is very hot the change will come sooner; and if the barometer is falling very fast and clouds be seen in W., a thunder-storm may be expected in the afternoon.

Sometimes the thunder-storm bursts first, and the wind sets in from S. afterwards; if only the storm comes it will probably be hot again next day.

Southerly bursters are generally to be expected from November to the end of February; they are always attended with strong electrical excitement, a stream of sparks being sometimes produced for an hour at the electrometer.

The temperature is subject to a rapid change, sometimes to the extent of 20° in a quarter of an hour, and for this reason the southerly burster would always be hailed with pleasure if free from dust.

The approach of the true burster is indicated by a peculiar roll of clouds, which, when once seen, cannot be mistaken; it is just above the south horizon, and extends on either side of it 15° or 20°, and looks as if a thin sheet of cloud were being rolled up like a scroll by the advancing wind.

That such is really the case may be seen when it is close to, and it looks as if the clouds were rolling up from out of, the advancing wind. That much of the force of the gale is expended in this uprush and battle with opposing winds is proved by the fact that the progress of the gale is usually only about two-thirds of the velocity of the wind.

Clouds of dust, which penetrate everywhere, announce the arrival of the wind; scud flies by overhead with great rapidity, being sometimes less than 2,000 feet high; rain may follow, but, if so, thunder and lightning come first.

The velocity of the wind is in most cases greatest within the first two hours, and varies from 30 to 70 miles per hour, but is usually from 50 to 60, and the rate of progress along the coast about 40 miles per hour.

The change of wind is sometimes very sudden; it may be fresh N.E. and in 10 minutes a gale from S. Hence vessels not on the look-out are sometimes caught unprepared, and suffer accordingly.

When a southerly wind commences anywhere south of Sydney it is at once telegraphed to the principal coast towns, and a signal put up indicating its approach.

When the wind is light these storms are often carried to sea by the general westerly tendency of the atmosphere, and may be seen passing by, the peculiar clouds indicating unmistakably their position.

In autumn the wind begins to change to westerly, and brings unsettled weather.

The winds from N. to S.W. are dry winds, warm in summer and cold in winter. Easterly winds are humid, and in summer cool and in winter mild. Southerly winds are in most cases dry, but in storms often bring rains.

TABLE I.—Showing the Temperature and Rainfall of various places in EUROPE and AMERICA (in *Italic*), and NEW SOUTH WALES (in Roman). Arranged in order of Temperature.

	Latitude.	Mean temperature.	Mean summer temperature.	Mean winter temperature.	Highest reading of thermometer.	Lowest reading of thermometer.	Mean rainfall.
	° ′	°	°	°	°	°	inches.
Kiandra	35 50 S.	45·0	54·5	33·1	96·2	*8·0	61·2
Dumfermline	*56 5 N.*	*45·3*	*55·30*	*28·4*	.....	.....	.....
Boston, U.S.A.	*42 20 N.*	*47·5*	*70·2*	*27·3*	*95·5*	*11·0	.....
Edinburgh	*55 57 N.*	*47·5*	*58·0*	*38·0*	.....	.....	.....
Nottingham	*52 57 N.*	*48·1*	*59·9*	*37·2*	*92·5*	*6·1*	*23·7*
Oxford	*51 45 N.*	*48·6*	*60·4*	*37·0*	.....	.....	.....
Manchester	*53 29 N.*	*48·8*	*59·8*	*38·3*	*91·2*	*3·0*	*33·0*
Liverpool	*53 24 N.*	*49·4*	*60·2*	*39·9*	*85·9*	*16·2*	*37·0*
Dublin	*53 21 N.*	*50·0*	*61·1*	*40·7*	.....	*25·0*	*30·0*
Haarlem	*52 23 N.*	*50·0*	*62·6*	*37 0*	.....	.....	.....
Bombala	36 50 S.	50·8	62·8	41·5	98·4	20·9	29·6
London	*51 32 N.*	*50·8*	*62·9*	*39·5*	*95·0*	*5·0*	*24·0*
Paris	*48 50 N.*	*51·3*	*64·7*	*37·8*	*104·0*	*10·3*	*22·9*
Ventnor	*50 35 N.*	*51·6*	*62·0*	*41·7*	*82·0*	*21·0*	*25·5*
Plymouth	*50 22 N.*	*52·0*	*60·8*	*42·4*	.....	.....	*39·0*
Cooma	36 12 S.	52·2	64·6	41·6	107·5	15·0	18·4
Helston	*50 7 N.*	*52·4*	*61·6*	*43·9*	*90·0*	*18·0*	*35·3*
Monaro Plains	36 S.	53·0	.....	.....	.....	.....	20·0
New York	*41 6 N.*	*53·2*	*70·9*	*30·1*	*97·0*	*2·0*	*46·5*
Queanbeyan	35 20 S.	53·6	67·2	41·9	109·0	20·0	23·7
Swansea	*51 38 N.*	*53·7*	*63·7*	*45·5*	.....	.....	.....
Mount Victoria	33 36 S.	54·2	65·4	42·3	105·1	21·8	34·8
Boulogne	*50 44 N.*	*54·4*	*67·2*	*40·2*	.....	.....	.....
Pavia	*45 11 N.*	*54·8*	*73·0*	*36·0*	.....	.....	.....
Milan	*45 27 N.*	*55·0*	*73·0*	*36·0*	.....	.....	*38·0*
All Lombardy	*45 30 N.*	*55·0*	.....	.....	.....	.....	.....
Orange, N.S.W.	33 18 S.	55·2	67·7	42·3	99·5	22·2	41·1
Toulouse	*43 36 N.*	*55·2*	*69·1*	*41·2*	*104·0*	*12·7*	*24·9*
Goulburn	34 45 S.	55·3	68·3	44·8	109·0	18·0	26·3
Moss Vale	34 32 S.	55·3	66·9	43·6	103·7	26·8	49·1
Bathurst Plains	33 30 S.	55·5	.....	.....	.....	.....	25·0
Armidale	30 34 S.	56·9	69·0	45·9	100·0	11·2	35·8
Washington	*38 52 N.*	*56·9*	*76·7*	*37·8*	*102·0*	*3·0*	.....
Bordeaux	*44 50 N.*	*57·0*	*71·1*	*43·0*	.....	.....	.....
Bathurst	33 24 S.	57·2	70·8	45·0	112·5	13·0	25·0
Tenterfield	29 5 S.	57·5	67·3	46·4	104·0	16·0	30·8
Faulconbridge	33 44 S.	57·6	66·1	47·8	92·3	34·4	53·6

* Degrees below zero.

TABLE I.—*continued.*

	Latitude.	Mean temperature.	Mean summer temperature.	Mean winter temperature.	Highest reading of thermometer.	Lowest reading of thermometer.	Mean rainfall.
	° ′	°	°	°	°	°	inches.
Madrid	*40 25 N.*	*57·6*	*74·1*	*42·1*	.....	.....	*9·0*
Marseilles	*43 18 N.*	*58·3*	*72·9*	*45·2*	.....	.....	*19·0*
Young	34 18 S.	59·1	72·2	46·5	110·0	20·0	30·8
Inverell	29 48 S.	59·5	73·2	46·1	105·0	20·0	21·1
Montpellier	*43 36 N.*	*59·5*	*76·0*	*44·4*	*101·5*	**0·4*	.....
Mudgee	32 35 S.	59·8	74·8	47·9	114·0	26·0	28·0
Albury	36 6 S.	59·8	72·2	46·4	117·0	20·0	29·0
Liverpool, N.S.W.	33 56 S.	59·9	70·3	48·6	106·0	22·0	42·7
Deniliquin	35 32 S.	59·9	73·2	48·5	121·0	16·0	16·4
Nice	*43 44 N.*	*60·1*	*72·5*	*48·8*	.....	.....	.....
Murrurundi	31 46 S.	60·2	72·5	47·9	107·3	19·0	27·9
Wagga Wagga	35 8 S.	60·2	74·4	46·7	111·0	20·0	26·0
Eden	37 0 S.	60·3	67·7	51·1	106·0	36·0	45·1
Rome	*41 54 N.*	*60·5*	*74·2*	*46·6*	*100·4*	*19·6*	*30·9*
Dubbo	32 18 S.	60·6	73·3	48·0	112·9	17·0	19·7
Forbes	33 27 S.	60·8	74·7	48·7	110·0	24·0	20·7
Cassilis	32 0 S.	61·0	74·7	47·4	112·2	22·2	25·6
Lisbon	*38 43 N.*	*61·5*	*70·9*	*52·5*	*101·8*	*24·7*	.....
Cape St. George	35 12 S.	61·9	69·8	52·8	97·2	35·6	56·3
Naples	*40 50 N.*	*62·0*	*74·4*	*47·6*	*104·0*	*23·0*	*39·3*
Wollongong	34 25 S.	62·1	70·0	53·6	101·0	36·7	38·3
Scone	32 4 S.	62·2	73·8	47·8	114·0	22·0	24·4
Barcelona	*41 22 N.*	*62·4*	*76·1*	*50·0*	.....	.....	.....
Toulon	*43 7 N.*	*62·3*	*75·2*	*48·5*	.....	.....	*19·7*
Sydney	33 51 S.	62·5	71·1	54·1	106·9	36·8	50·1
West Maitland	32 47 S.	62·5	73·1	51·4	112·0	24·0	34·8
Port Macquarie	31 25 S.	63·7	72·4	55·8	101·3	34·0	63·3
Windsor	33 36 S.	63·8	72·3	52·6	113·9	21·5	34·3
Newcastle	32 55 S.	63·9	71·9	54·7	120·0	31·3	50·0
Wentworth	34 8 S.	64·4	77·8	52·1	119·0	27·2	13·5
Muswellbrook	32 17 S.	64·5	76·2	51·0	115·8	20·0	21·7
Orange, France	*44 7 N.*	*65·0*	*83·7*	*46·8*	*106·5*	**0·4*	.....
Bourke	30 3 S.	65·8	80·3	52·3	120·0	30·0	18·0
Messina	*38 11 N.*	*65·8*	*77·2*	*55·0*	.....	.....	.....
Narrabri	30 20 S.	68·0	81·6	53·1	118·3	26·5	23·2
Grafton	29 43 S.	68·3	75·6	56·3	118·0	21·0	38·1
New Orleans	*30 0 N.*	*69·8*	*82·0*	*55·8*	*94·0*	*31·0*	.....
Cairo	*30 3 N.*	*72·3*	*85·1*	*58·2*	.....	.....	.....

* Degrees below zero.

TABLE II.—Showing Meteorological elements of the Climate of forty-three places in NEW SOUTH WALES.

	Latitude S.	Longitude E.	Altitude.	Mean height of Barometer at sea-level.	Mean temperature.	Mean maximum temperature in shade during hottest month.	Mean minimum temperature in shade during coldest month.	Mean diurnal range of temperature in shade.	Mean humidity of air—saturation, 100.	Mean extent of cloudy sky—scale, 0, clear; 10, overcast.	Prevailing direction of wind.	Average rainfall.
	° ′	° ′	ft.									
Casino	28 50	153 0	50	30·020	67·1	95·3	39·3	28·6	77·0	5·1	S.E.	42·99
Tenterfield	29 5	152 4	3,500*	..	57·5	81·0	34·4	22·3	..	4·7	W.	30·80
Grafton	29 43	152 56	40	30·022	68·3	93·3	39·1	27·8	67·6	4·3	W.	38·13
Inverell	29 48	151 10	1,953	29·968	59·5	85·2	33·4	23·9	76·5	3·1	W.	21·13
Bourke	30 3	145 58	456	30·032	69·1	92·2	41·3	20·9	57·2	1·9	S.	17·95
Narrabri	30 20	149 46	697	..	68·0	97·5	38·7	26·3	..	2·1	W.	23·24
Armidale	30 34	151 46	3,278	29·948	56·9	83·3	32·9	24·8	78·2	4·8	W.	35·76
Goonoo Goonoo	31 20	150 54	1,500	30·065	61·3	89·4	32·2	26·1	69·9	2·9	W.	26·55
Port Macquarie	31 25	152 54	53	30·010	63·7	79·2	46·8	15·7	8·21	3·1	S.W.	63·31
Murrurundi	31 46	150 51	1,545	..	60·2	85·8	40·6	19·8	..	3·6	W.	27·85
Cassilis	32 0	150 0	1,000*	..	61·0	91·0	36·4	25·6	..	1·1	N.W.	25·63
Scone	32 4	150 53	680	..	62·2	91·6	44·1	21·1	..	3·7	S.W.	24·40
Muswellbrook	32 17	150 53	475	..	64·5	92·2	39·2	26·4	..	4·0	N.W.	21·66
Dubbo	32 18	148 35	865	..	60·6	90·6	35·3	25·1	..	2·6	N.E.	19·70
Mudgee	32 35	149 35	1,500	..	59·8	87·7	35·7	19·4	..	..	W.	28·01
West Maitland	32 47	151 35	98	30·015	62·5	87·0	42·5	21·5	..	4·9	W.	34·78
Newcastle	32 55	151 50	112	30·043	63·9	84·0	44·6	17·9	72·3	4·9	W.	49·99
Orange	33 18	149 9	2,891	..	55·2	80·8	34·0	16·9	..	4·8	S.	41·05
Bathurst	33 24	149 37	2,200	30·049	57·2	88·9	29·6	30·3	75·8	4·8	W.	25·04
Forbes	33 27	148 5	1,120	30·165	60·8	87·9	35·4	21·0	64·4	2·8	W.	24·62
Kurrajong	33 33	150 45	1,870	..	55·0	74·9	37·7	13·7	..	4·8	W.	56·81
Windsor	33 36	150 49	41	30·043	63·8	90·1	37·5	26·1	74·4	6·0	S.W.	34·32
Mount Victoria	33 36	150 49	3,490	30·019	54·2	82·6	32·2	20·1	79·6	5·9	W.	34·84
Woodford	33 44	150 24	2,191	29·998	57·6	75·0	41·3	11·8	..	..	W.	53·56
Parramatta	33 48	151 59	49	30·025	62·2	86·4	38·4	22·1	..	3·7	S.W.	39·31
South Head	33 50	151 16	254	30·024	61·7	82·5	46·6	..	..	5·9	S.W.	48·28
Sydney	33 51	151 12	146	30·039	62·5	79·1	45·1	14·3	73·1	5·3	W.	50·90
Liverpool	33 56	150 57	50	30·021	59·9	82·4	36·7	25·0	..	4·6	W.	42·74
Wentworth	34 8	142 0	144	30·137	64·4	94·1	40·8	23·3	64·0	3·7	S.W.	13·54
Young	34 18	148 21	1,600*	..	59·1	90·8	35·3	27·4	..	2·8	W.	30·84
Wollongong	34 25	150 56	67	30·020	62·1	80·1	45·0	14·9	65·9	..	S.W.	38·32
Moss Vale	34 32	150 23	2,205	..	55·3	78·7	35·3	15·9	..	..	W.	49·08
Goulburn	34 45	149 45	2,129	30·041	55·6	85·1	32·3	25·8	76·1	5·3	W.	26·29
Wagga Wagga	35 8	147 24	739	30·089	60·2	87·6	35·8	19·7	77·4	2·5	N.E.	25·99
Cape St. George	35 12	150 45	175	29·995	61·9	81·7	46·0	13·3	81·9	5·8	S.	56·25
Lake George	35 17	149 24	2,267	..	56·3	85·0	36·1	27·1	73·9	5·5	N.W.	26·00
Queanbeyan	35 20	149 15	2,000*	..	53·6	80·2	33·6	16·7	..	5·0	N.W.	23·74
Urana	35 20	146 20	400	..	62·1	91·9	39·6	20·3	..	3·8	N.W.	22·05
Deniliquin	35 32	145 2	320	30·108	59·9	94·5	35·3	30·6	70·2	3·2	S.W.	16·44
Kiandra	35 52	148 32	4,640	30·061	45·1	75·9	20·2	25·4	74·6	5·9	N.W.	61·23
Albury	36 6	147 0	572	30·012	59·8	94·3	33·4	30·1	72·9	4·7	N.E.	28·96
Cooma	36 12	149 9	2,637	29·996	52·2	80·9	27·8	26·6	73·0	5·8	N.	18·42
Eden	37 0	149 59	107	29·989	60·3	77·3	43·7	13·9	76·0	5·5	S.W.	45·05

* Approximate altitude.

TABLE III.—Averages of Meteorological Conditions at Sydney for each month in the Year.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly mean.
(*a*) Average monthly reading of barometer at 32° Fahrenheit and mean sea-level	29·919	29·954	30·048	30·048	30·080	30·078	30·091	30·086	30·033	29·998	29·963	29·889	30·016
Mean monthly temperature	71·1	70·6	68·9	64·6	58·0	54·3	51·9	54·0	58·1	63·2	66·1	69·4	62·5
Average monthly reading of maximum thermometer	78·1	77·0	75·4	71·3	65·2	61·2	59·3	62·3	66·5	71·6	74·1	77·1	69·9
Average monthly reading of minimum thermometer	64·2	64·2	62·6	58·0	52·2	48·8	45·1	46·8	50·5	55·5	58·6	62·2	55·7
(*b*) Earth thermometers, 2 feet 6 inches deep	73·9	73·6	72·0	66·9	60·6	57·6	56·2	54·5	58·0	61·1	65·5	68·8	64·1
Earth thermometers, 5 feet deep	70·5	71·3	70·8	67·7	63·6	60·3	58·7	57·0	58·0	60·2	63·4	66·4	64·0
,, ,, 10 feet ,,	67·2	68·4	68·5	67·0	64·4	62·0	60·1	58·5	58·6	59·7	61·8	64·0	63·4
,, ,, 19 feet ,,	63·8	65·0	65·6	65·6	64·8	63·8	62·6	61·5	60·9	60·8	61·3	62·3	63·2
Mean temperature of sea-water	71·1	71·6	70·8	68·5	64·7	60·4	57·7	57·5	60·0	63·3	66·7	69·3	65·1
Sea-water warmer than air	0·0	1·0	1·9	3·9	6·7	6·1	5·8	3·5	1·9	0·1	0·6	0·1	2·6
(*c*) Average monthly extent of cloudy sky	6·1	6·5	6·2	5·5	4·6	5·3	4·1	4·0	4·4	5·3	5·7	5·8	5·3
(*d*) Greatest monthly rainfall	10·68	18·56	18·70	25·43	12·55	14·25	11·95	12·77	10·90	24·69	11·13	7·80	max. 25·43
Least monthly rainfall	0·57	0·53	0·85	0·06	0·18	0·27	0·06	0·29	0·12	0·07	0·14	0·39	min. 0·06
Average monthly rainfall	4·030	5·300	4·940	6·700	5·052	5·280	4·279	2·922	2·560	3·436	3·111	2·775	50·050
Average number of days rain	13	14	15	14	13	13	12	11	11	13	12	11	152
Average monthly evaporation	6·394	4·689	4·209	2·686	1·839	1·536	1·838	2·664	3·932	5·647	6·553	7·372	48·369
Average monthly ozone	4·5	4·6	4·9	5·1	4·7	5·6	5·2	5·0	5·4	5·4	5·1	4·7	5·04

(*a*) *Barometer.*—The extreme variation of the barometer in eighteen years at Sydney is from 28·901, 13th December, 1863, to 30·678, 11th July, 1875, and there are two maxima, April and July, and two minima, June and December, in each year.

(*b*) *Earth thermometers.*—The maximum temperature is reached about the end of March, and the minimum in September and October; the minimum is therefore about six months after the maximum. The maximum and minimum are both about two months after the same conditions in the air temperature.

(*c*) *Clouds.*—The daily distribution of cloud at Sydney shows a slight preponderance at 9 a.m. The averages for a number of years at each hour are—9 a.m., 5·0; 3 p.m., 4·7; and 9 p.m., 4·4; and these proportions are pretty constantly maintained in each month of the year, but occasionally in summer the quantity at 9 p.m. is slightly in excess of 9 a.m.

(*d*) *Rainfall.*—Least total for any year, 21·490 inches, in 1849. The longest period without rain was twenty days, in September, 1866. No month has been entirely without rain.

TABLE IV.—Averages of Anemometer and Pluviometer Records at the Sydney Observatory, showing the prevalence of each Wind for every season in the Year, also the average number of Rainy hours, and the average quantity of Rain per hour.

	Number of hours the wind blew from each point.																Velocity.		Greatest pressure, direction of wind, and date.		
	S.	S.S.W.	S.W.	W.S.W.	W.	W.N.W.	N.W.	N.N.W.	N.	N.N.E.	N.E.	E.N.E.	E.	E.S.E.	S.E.	S.S.E.	Total miles.	Mean per hour			
Average winds in spring, September, October, November.....	67	44	25	36	78	59	40	27	36	53	73	61	46	25	22	32	8,222	11·7	38·7	W.	1874. 6 Sept.
Average winds in summer, December, January, and February	105	52	19	19	27	25	18	13	29	41	84	95	60	37	40	48	8,446	12·0	40·5	S.S.W.	1869. 12 Feb.
Average winds in autumn, March, April, and May	59	48	30	42	112	94	46	27	36	31	46	37	32	27	26	33	7,239	10·1	38·7	N.N.E.	1870. 9 March
Average winds in winter, June, July, and August	23	36	29	56	191	157	73	35	36	21	20	15	11	9	10	11	7,636	10·5	33·6	N.E.	1867. 20 June.
Average number of hours per annum the wind blows from each point.....	1,331	..	797	..	2,311	..	956	..	678	..	1,241	..	772	..	490	..	..	..	..	....	....
Average miles of wind per annum from each point	16,650	..	8,925	..	24,495	..	6,750	..	4,576	..	13,829	..	7,226	..	4,666	..	..	..	..	....	....
Average number of rainy hours per annum with each wind	44	43	44	28	49	16	8	4	3	12	18	13	15	12	20	21	..	..	..	....	....
Average amount of rain with each wind per annum	4·741	4·228	4·655	2·863	4·309	1·888	0·762	0·552	0·092	1·042	3·263	2·100	2·703	1·510	2·735	1·915	..	..	..	....	....
Rate of rain per hour with each wind.....	0·108	0·098	0·106	0·102	0·088	0·118	0·095	0·138	0·031	0·087	0·181	0·161	0·180	0·126	0·137	0·091	..	..	..	....	....

The rainfall measurements were made 65 feet above ground, at which altitude the amount is 37·4 per cent. less than that collected on the ground.

TABLE V.—Mean Temperature of the Air and mean Rain, in inches, at five stations in England.

Month.	Helston.		Ventnor.		Nottingham.		Manchester.		Liverpool.	
	Mean temperature.	Rain.	Mean temperature.	Rain.	Mean temperature.	Rain.	Mean temperature.	Rain.	Mean temperature.	Rain.
	°	in.	°	in,	°	in.		in.	°	in.
January	44·1	3·2	41·6	2·3	36·9	1·8	37·3	2·3	40·0	1·6
February	42·7	2·7	40·0	1·2	35·9	1·3	35·8	1·5	38·0	0·9
March	45·6	3·2	44·3	1·8	41·3	1·4	41·4	2·2	42·0	1·7
April	49·1	2·7	48·4	1·9	45·3	1·7	46·4	2·0	45·9	1·7
May	53·0	2·8	52·6	2·4	51·4	2·0	51·9	1·7	51·5	1·4
June	58·3	2·5	59·1	1·8	58·2	2·3	58·3	3·1	57·7	2·6
July	62·3	2·4	62·6	2·5	60·0	2·0	60·2	2·8	60·9	2·6
August	63·5	2·3	64·4	2·2	61·6	3·2	....	....	61·9	2·6
September	60·0	2·4	61·4	3·0	56·5	2·1	56·5	2·9	57·7	2·4
October	54·8	4·6	55·2	4·4	49·7	3·0	49·5	3·3	51·4	2·8
November	48·3	2·6	46·3	2·5	40·9	1·4	40·6	2·3	43·8	1·7
December	46·5	3·9	43·4	2·9	38·9	1·5	38·4	3·1	41·6	2·1
Sums	628·2	35·3	619·3	28·9	576·6	23·7	516·3	27·2	592·4	24·1
Means	52·35	....	51·60	....	48·05	....	46·93	11 months	49·37	....
Winter.. December	46·5	3·9	43·4	2·9	38·9	1·5	38·4	3·1	41·6	2·1
Winter.. January	44·1	3·2	41·6	2·1	36·9	1·8	37·3	2·3	40·0	1·6
Winter.. February	42·7	2·7	40·0	1·2	35·9	1·3	35·8	1·5	38·0	0·9
Sums	133·3	9·8	125·0	6·2	111·7	4·6	111·5	6·9	119·6	4·6
Means	44·4	3·3	41·7	3·1	37·2	1·5	37·2	2·3	39·9	1·5
Summer.. June	58·3	2·5	59·1	1·8	58·2	2·3	58·3	3·1	57·7	2·6
Summer.. July	62·3	2·4	62·6	2·5	60·0	2·0	60·2	2·8	60·9	2·6
Summer.. August	63·5	2·3	64·4	2·2	61·6	3·2	....	....	61·9	2·6
Sums	184·1	7·2	186·1	6·5	179·8	7·5	118·5	5·9	180·5	7·8
Means	61·4	2·4	62·0	2·2	59·9	2·5	59·3	3·0	60·2	2·6

Sydney: Thomas Richards, Government Printer.—1883.

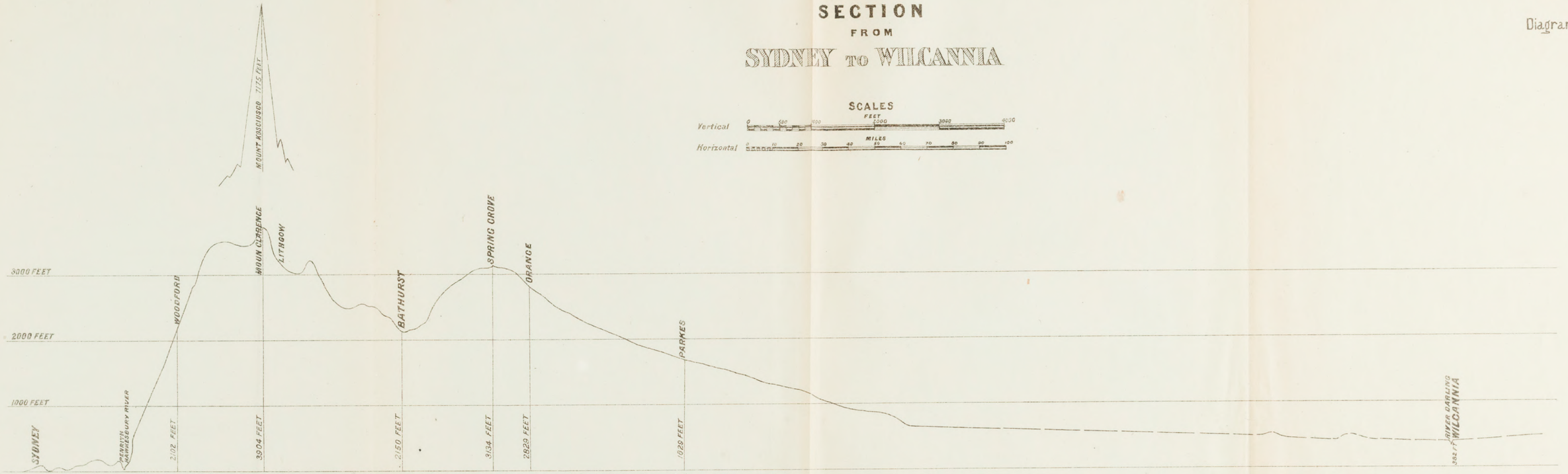
Diagram I.

SECTION
FROM
SYDNEY to WILCANNIA

SCALES

Vertical — FEET: 0, 500, 1000, 2000, 3000, 4000

Horizontal — MILES: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100



Datum High Water of Spring Tide at Sydney.

Diagram 2.

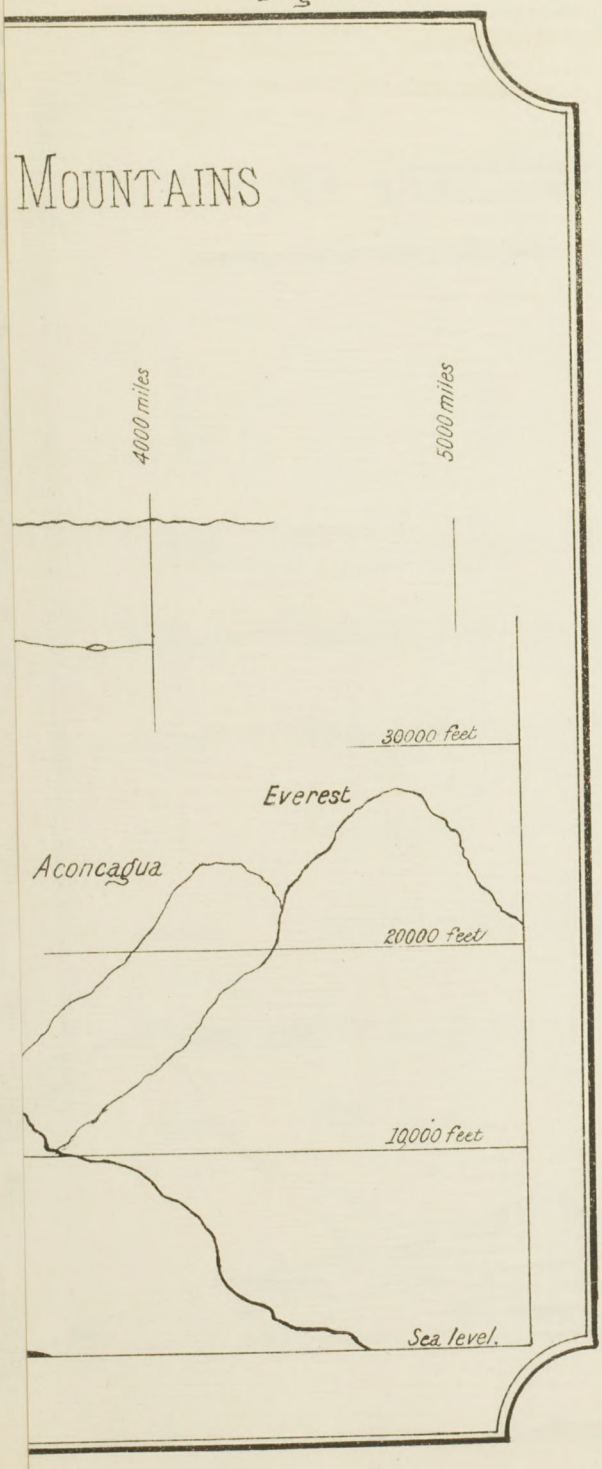
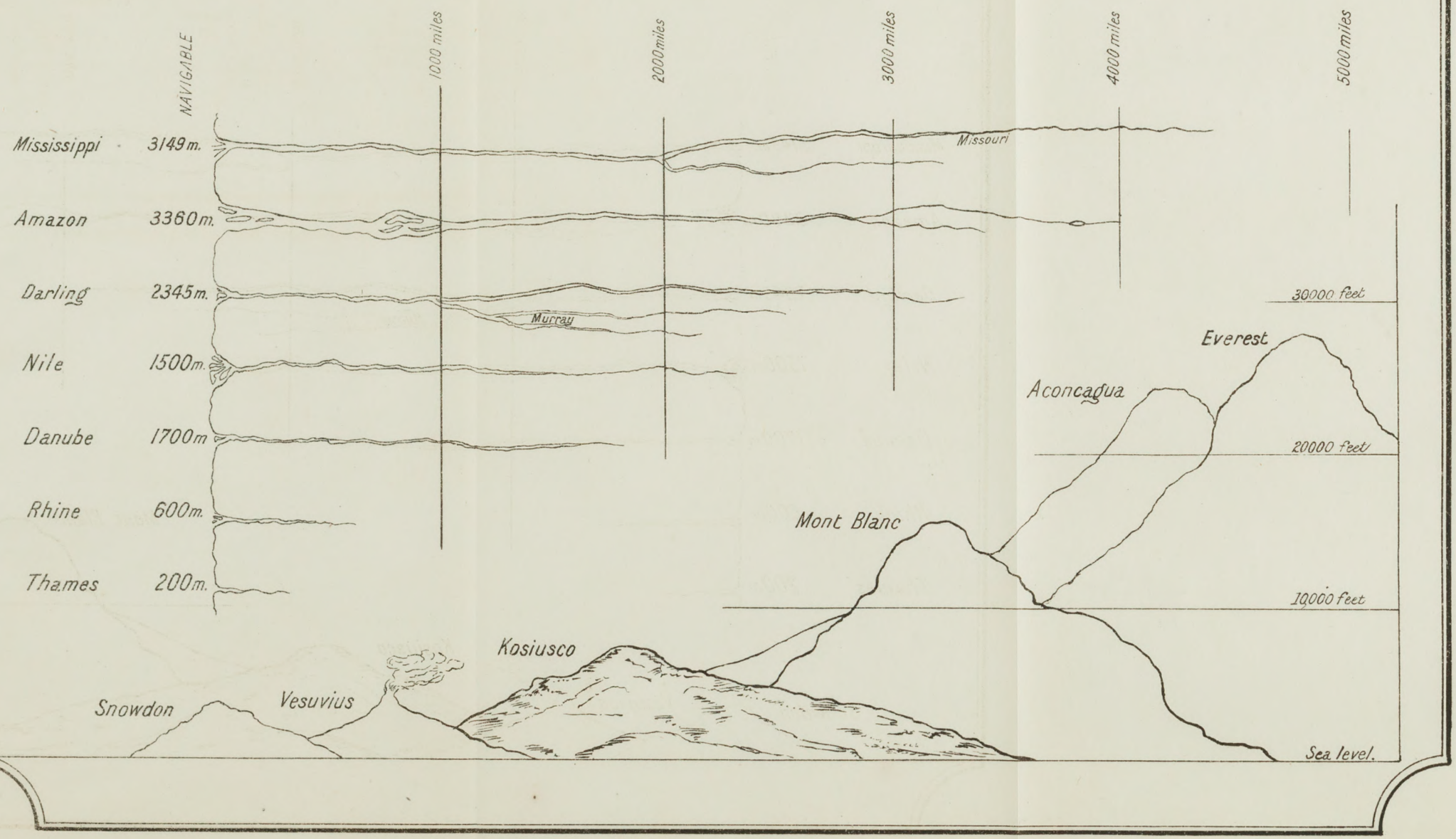
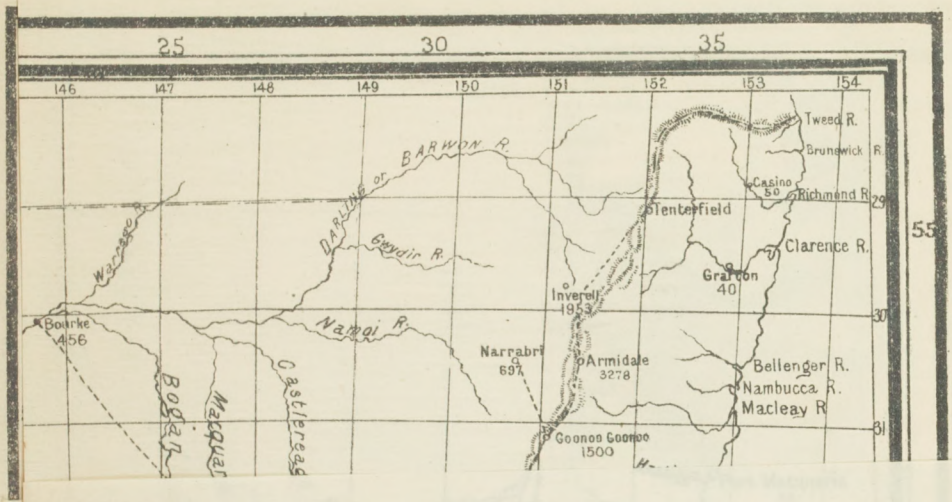

MOUNTAINS
4000 miles
5000 miles
30000 feet
Everest
Aconcagua
20000 feet
10000 feet
Sea level.

Diagram 2.

Comparison of lengths of Rivers and heights of Mountains



ın Temperature



OUTLINE MAP OF EUROPE

With Names of Towns in N.S.W. (in red) placed beside European Towns of corresponding Mean Temperature

SCOTLAND
Edinburgh
KIANDRA
IRELAND
ENGLAND
MANARO PLAINS
Swansea
QUEANBEYAN
BOMBALA
London
COOMA
Plymouth
Ventnor
COOMA
PART OF MANARO PLAINS
Paris
BATHURST PLAINS
FRANCE
PRUSSIA
SWITZERLAND
AUSTRIA
Lyons
FAULCONBRIDGE
ORANGE
LOMBARDY
BATHURST
Bordeaux
Orange
MUSCLEBROOK
ORANGE
YOUNG
Toulouse
Montpelier
Nice
Florence
GOULBURN
INVERELL
Toulon
BUDGEE
INVERELL
SYDNEY
ITALY
Rome
DUBBO
CAPE ST GEORGE
Naples
SCONE
Barcelona
SCONE
Madrid
TENTERFIELD
CASSILIS
Lisbon
PORTUGAL
SPAIN
Messina
BOURKE

OUTLINE MAP
OF
NEW SOUTH WALES
SHOWING MOUNTAINS, RIVERS, & TOWNS MENTIONED IN TABLE II.
The figures show the height above sea level, and the dotted lines, the Railways

Tweed R.
Brunswick R.
Casino 50
Richmond R.
Clarence R.
Glenterfield
Grafton 40
Inverell 1953
Narrabri 697
Armidale 3278
Bellenger R.
Nambucca R.
Macleay R.
Gooneo Goomoo 1500
Hastings R.
Port Macquarie 53
Manning R.
Murrurundi 1545
Cassilis
Scone 1650
Muswellbrook 1475
Dubbo 868
Mudgee 1500
Hunter R.
West Maitland 126
Lambton
Port Stephens
NEWCASTLE 112
Forbes 1120
Orange 2801
Bathurst 2200
Hawkesbury R.
Windsor
Parramatta
Victoria
Woodford
SYDNEY
South Head 254
Young
Liverpool 168
Wollongong 67
Goulburn 2125
Shoalhaven R.
Cape St George 175
Wentworth 144
Hay 305
Edward R.
Wakool R.
Deniliquin 320
Urana 400
Wade Waggs 739
Albury 572
Lake George 2267
Queanbeyan
Kiandra 4640
Dena R.
Tuross R.
Cooma 2637
Bega R.
Eden 107

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